AOS Classification Committee – North and Middle America

Proposal Set 2023-A

11 August 2022, revised 1 March 2023

Separate Golden-crowned Warbler *Basileuterus culicivorus* into as many as four species

Effect on NACC (and SACC):

Approval of this proposal would separate the currently recognized species *Basileuterus culicivorus* into as many as four species. For the NACC, it would mean splitting Mexican and Central American *culicivorus* from all the South American forms. The other two proposed splits are within South America, and therefore, in the SACC area.

Background:

AOS currently recognizes *Basileuterus culicivorus* as a single species consisting of four morphological groups and distributed from northeastern Mexico to northern Argentina (AOU 1998, Chesser et al. 2012). However, the HBW/BirdLife International Checklist considers the four morphological groups to be separate species, conflicting with the other three world bird lists. This proposal aims to summarize available information and contribute to the effort of consolidating the global lists.

Basileuterus culicivorus is a widespread species. There is substantial geographic variation within its ample geographic distribution: 14 subspecies are currently recognized and clustered into four morphological groups (Phelps et al. 2020):

(1) *culicivorus* (Deppe 1830), Stripe-crowned Warbler, which includes four subspecies [*flavescens*, *brasherii*, *culicivorus*, *godmani*] distributed from northern Mexico to western Panama.
(2) *cabanisi* (Berlepsch 1879), Cabanis's Warbler, which includes four subspecies [*occultus*, *austerus*, *indignus*, *cabanisi*] in Colombia and northwestern Venezuela.
(3) *auricapillus* (Swainson 1838), Golden-crowned Warbler, which includes five subspecies [*olivascens*, *segrex*, *auricapillus*, *azarae*, *viridescens*] from northeastern Venezuela, through Guyana, Brazil, Bolivia, Paraguay, and Uruguay to northern Argentina.
(4) *hypoleucus* (Bonaparte 1850), White-bellied Warbler, a monotypic group from south-central Brazil, southeastern Bolivia, and east-central Paraguay.

Hellmayr (1935) treated *Basileuterus culicivorus* as a species with nine subspecies (the other four subspecies [*occultus*, *austerus*, *segrex*, *azarae*] were described in 1949); additionally, he recognized *Basileuterus hypoleucus* as a separate monotypic species. Peters (1968) listed *Basileuterus culicivorus* as a species with 13 subspecies, and monotypic *Basileuterus hypoleucus* as a separate species.

In 2011, the SACC passed a proposal to merge *B. hypoleucus* with *B. culicivorus* based on playback experiments, lack of differences in vocalizations and genetics, and the presence of mixed pairs and intermediates where their ranges overlap (Proposal 493 - https://www.museum.lsu.edu/~Remsen/SACCprop493.html). The NACC adopted this merger the following year (Chesser et al. 2012).

New information:

The genetic analyses of Vilaça and Santos (2010) were used to support the merger of *B. hypoleucus* with *B. culicivorus*, but they also provided new information for assessing species status of the following morphological groups: *culicivorus*, *cabanisi*, and *auricapillus*. Seven subspecies of *B. culicivorus* were included (3 within the *culicivorus* group [*flavescens*, *brasherii*, *culicivorus*], 1 within the *cabanisi* group [*occultus*], and 3 within the *auricapillus* group [*auricapillus*, *azarae*, *olivascens*]), as well as the monotypic *B. hypoleucus*. Bayesian phylogenetic analysis of the mitochondrial cytochrome b gene showed a branching pattern of paraphyletic clustering with southern clades nested within northern clades (**Figure 1**). Interestingly, the *culicivorus* group was not recovered as monophyletic. Additionally, individuals within the *auricapillus* group from Brazil, Argentina, and Paraguay were more closely related to *hypoleucus* than to *auricapillus* from Venezuela. The authors concluded that whether the five clades described can be defined as different subspecies or species requires further studies and larger sampling. No further phylogeographic studies on *B. culicivorus* have been conducted since Vilaça and Santos (2010).

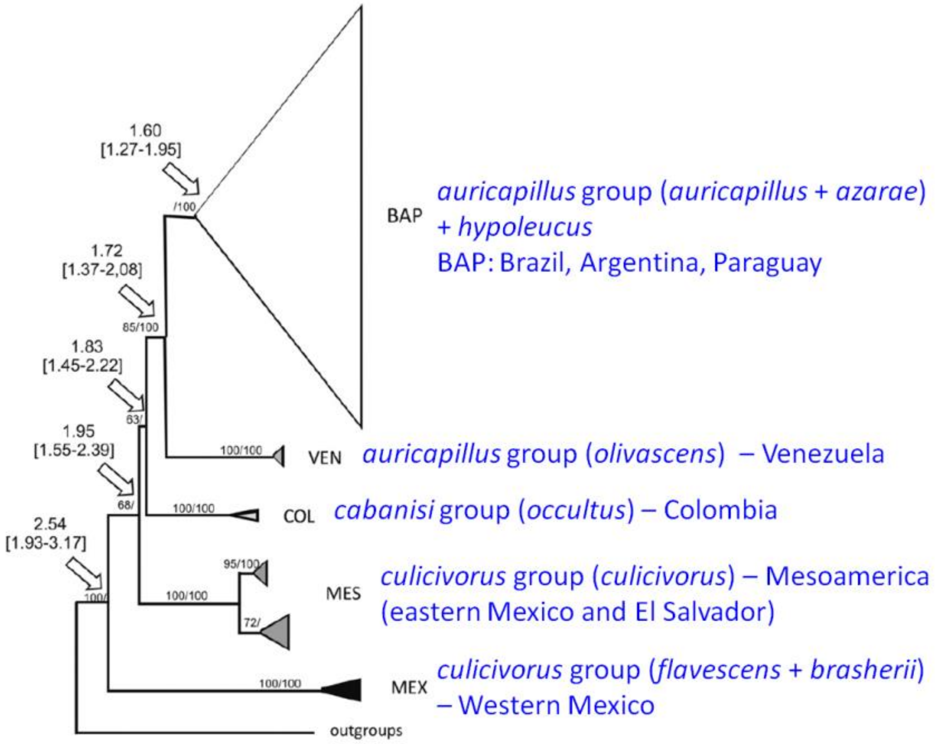


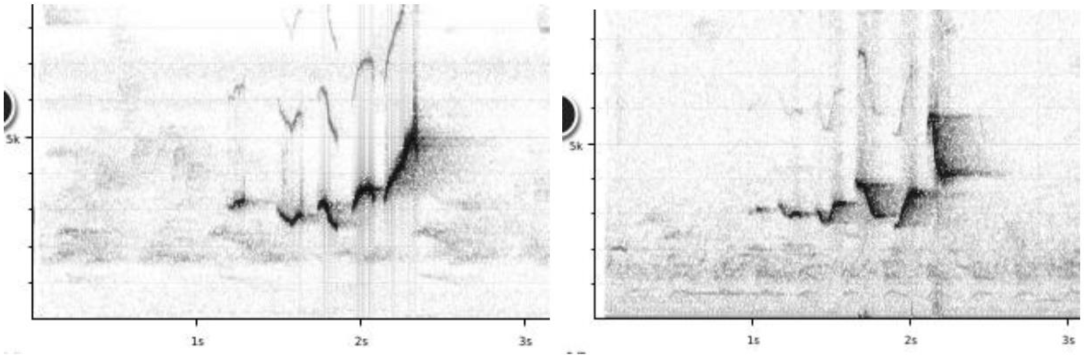
Fig. 3. Condensed tree of the Cyt-*b* gene, exhibiting the times of divergence of each clade in million years ago (MYA). The number within brackets shows the 95% confidence interval for each estimate.

Figure 1. Condensed mitochondrial phylogenetic tree presented as in Vilaça and Santos (2010). Labels in blue were added to make explicit the morphological group (and subspecies) represented by the different clades.

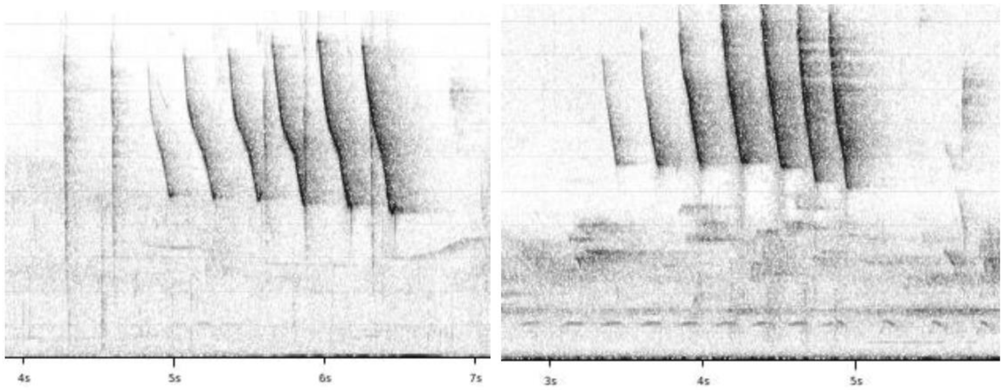
Boesman (2016) conducted analyses and voice comparisons of the *culicivorus*, *cabanisi*, and *auricapillus* groups, using available recordings from Xeno Canto and Macaulay Library. He stated that the three groups have clearly different songs, although the *culicivorus* group was found to be the most distinct. He noted that there appears to be an area of clinal change between *olivascens*, from the *auricapillus* group, and *cabanisi*, which requires further investigation. Additionally, he mentioned that *B. hypoleucus* has the same song as the *auricapillus* group.

The following text and images with voice descriptions and sonograms are from Boesman (2016) and correspond to the *culicivorus*, *cabanisi*, and *auricapillus* groups:

"*culicivorus* group" (with *brasierii*, *flavescens* and *godmani*) of C America
Song is a short melodious phrase, consisting of several sweet notes but ending with an emphasized higher-pitched note: "wee-chu-wee-chi-WEE!" or similar.

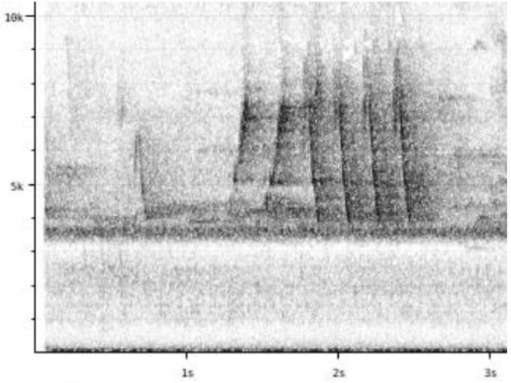


"*cabanisi* group" (with *occultus*, *austerus* and *indignus*) of N Colombia and NW Venezuela
Song is a series of repeated almost identical notes covering a very large freq. range, and reaching maximum frequencies of 9-11kHz.

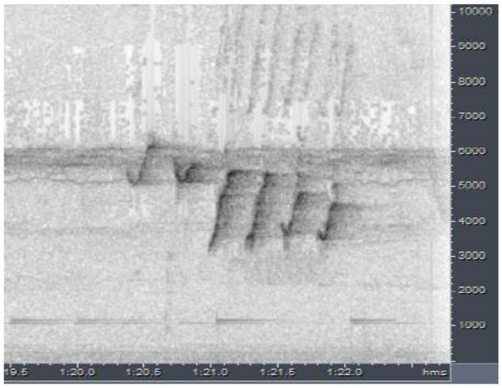


"*auricapilla* group" (remaining five races) of NE & S Venezuela and CE South America
Song is typically a short series of repeated notes followed (sometimes after 1-2 transition notes) by 2- 4 more emphatic notes.

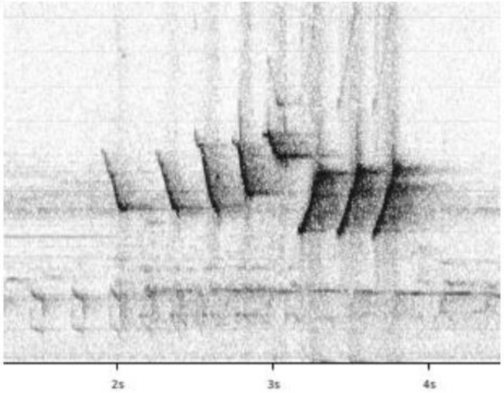
olivascens (Venezuela)

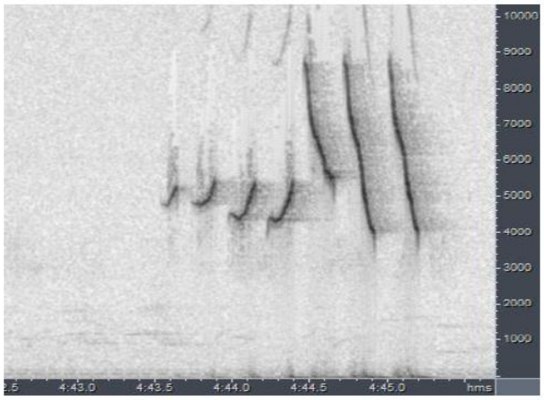


Trinidad

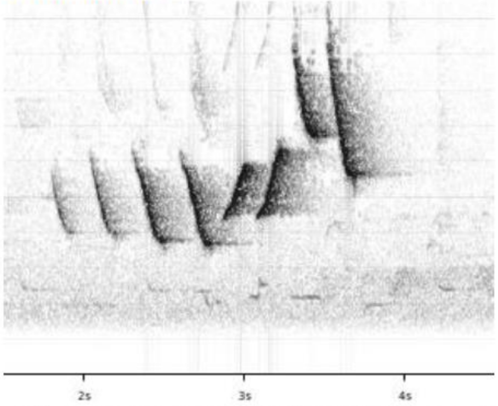


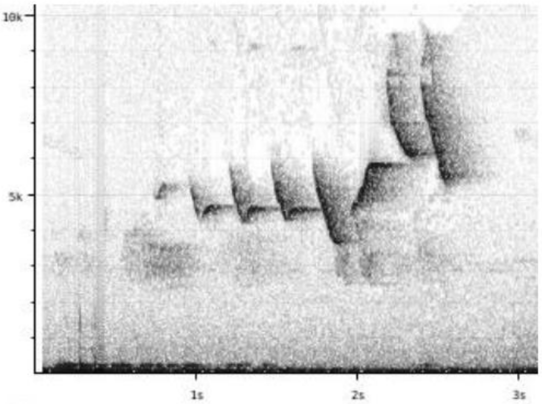
segrex

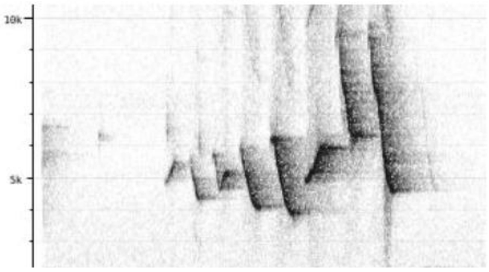




Brazilian races



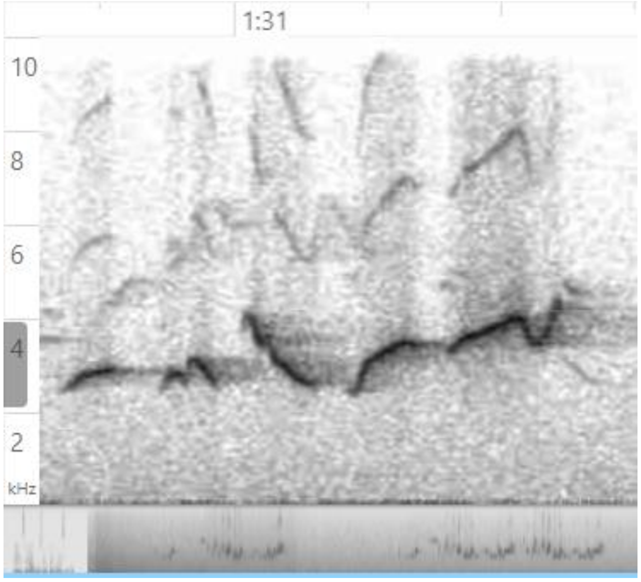




Boesman (2016) quantified the extent of vocal differences following Tobias et al. (2010), and provided the following scores:

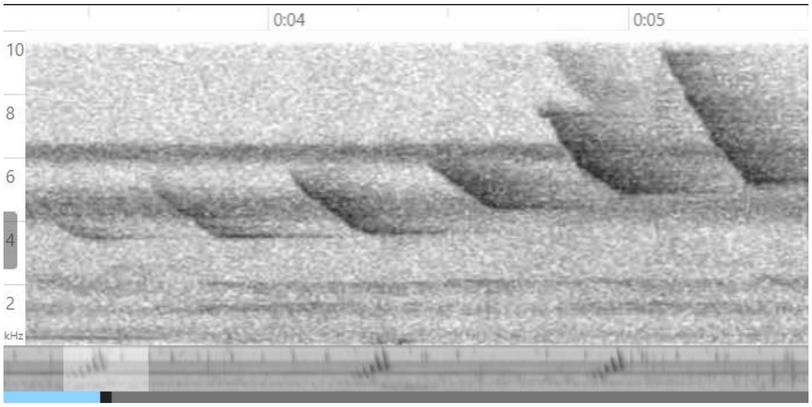
	cabanisi	***auricapillus***
culicivorus	Notes in *culicivorus* have a much lower max. freq. (score 3) and songs consist of a higher number of different note shapes (score 2). Total score 5.	Initial note(s) in *culicivorus* much lower-pitched (score 3) and all notes different in shape (score 1). More variation within *auricapillus*. Total score 4.
cabanisi	---	*cabanisi* has basically a single note shape (1-2) and all notes at high pitch (score 2-3). Total score 4.

A problem with the Birdlife vocal analyses, especially given the time constraints under which they were conducted, is that sample sizes and geographic representation in the sampling are not provided. This is particularly problematic in the case of oscine birds, which are less stereotyped in song than suboscines or many non-passerines. Intraspecific variation is quite prevalent in some species of Parulidae, and intra-group and intra-individual variation in the key characters identified above are evident in a brief survey of the *B. culicivorus* recordings in the Macaulay Library. Although the vocalizations of the *culicivorus* group seem reasonably consistent, those of the *cabanisi* group are much more variable than indicated. For example, this song from Boyacá, Colombia (ML 260191), presumably of subspecies *austerus*, sounds much closer to the songs of the *culicivorus* group than to those of the *cabanisi* group depicted above, having variable note shapes at a relatively low frequency and ending with an emphasized note of higher frequency (although not as high as in the samples of *culicivorus* above):

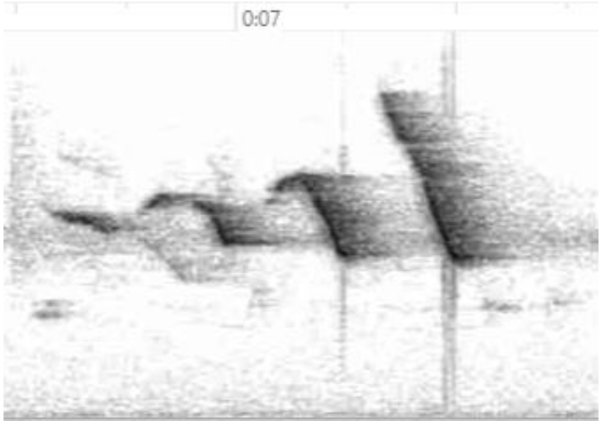


This is so different from the *cabanisi* songs above that one might question the species ID, but the recordist was Mauricio Álvarez, the well-known ornithologist who established the sound collection at the Humboldt Institute, so this seems unlikely.

Songs of some other individuals from the *cabanisi* group, although sounding less similar to those of the *culicivorus* group, also contain variable note shapes and notes of differing frequency, contrasting with the uniformity in note shape and frequency proposed in Boesman (2016). For example, here's a recording from Meta, Colombia (ML437387871), also presumably of *austerus*:



And this recording is from Cauca, Colombia (ML233704001) – this individual, presumably subspecies *occultus*, first sings this song:

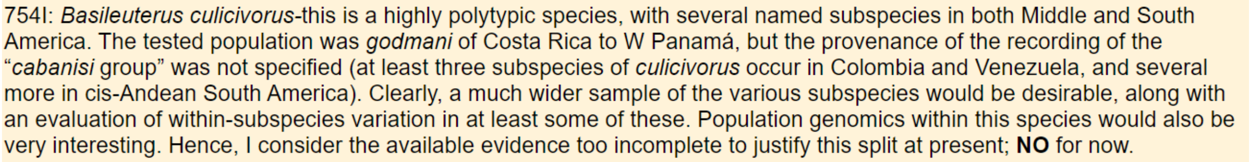


and then later sings a song in which the note shapes are similar and closer to the samples of *cabanisi* above. In our view, such variability in the characters proposed to separate the *culicivorus* and *cabanisi* groups warrants further investigation. Note also that Boesman (2016) detected additional variability to the east, where songs of *olivascens* of the *auricapillus* group appear to form part of a cline with *cabanisi*.

SACC proposal 754 (https://www.museum.lsu.edu/~Remsen/SACCprop754.htm) suggested that 13 taxa be elevated to species rank based on data from playback experiments. One of these taxa was *B. culicivorus*. The proposal suggested splitting the South American populations from the Central American populations. The proposal focused on two allopatric subspecies: *godmani* (part of the *culicivorus* group) of Costa Rica and Panama, and the *cabanisi* group from Colombia and Venezuela. The evidence provided in the proposal consisted of playback experiments conducted by Freeman and Montgomery (2017). From playback experiments conducted on *godmani* in Costa Rica, 13 of 17 territorial birds failed to respond to song playback from the *cabanisi* group.

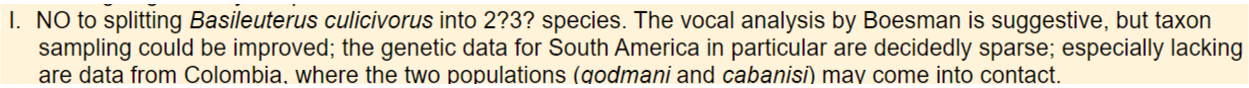
Proposal SACC 754 is listed as pending. Two members of the SACC (Cadena and Areta) voted NO on the entire proposal, and specific comments on *Basileuterus culicivorus* are as follows:

1. Stiles:



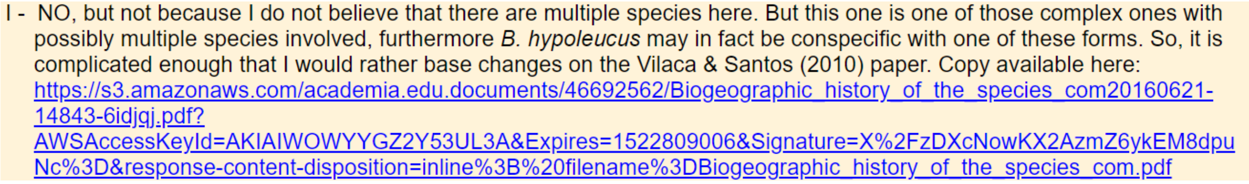
754I: *Basileuterus culicivorus*-this is a highly polytypic species, with several named subspecies in both Middle and South America. The tested population was *godmani* of Costa Rica to W Panamá, but the provenance of the recording of the "*cabanisi* group" was not specified (at least three subspecies of *culicivorus* occur in Colombia and Venezuela, and several more in cis-Andean South America). Clearly, a much wider sample of the various subspecies would be desirable, along with an evaluation of within-subspecies variation in at least some of these. Population genomics within this species would also be very interesting. Hence, I consider the available evidence too incomplete to justify this split at present; **NO** for now.

Later comments from Stiles:



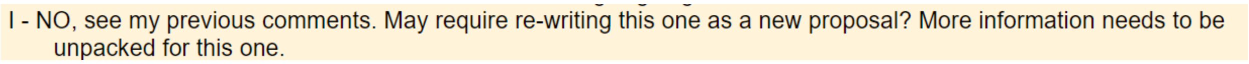
I. NO to splitting *Basileuterus culicivorus* into 2?3? species. The vocal analysis by Boesman is suggestive, but taxon sampling could be improved; the genetic data for South America in particular are decidedly sparse; especially lacking are data from Colombia, where the two populations (*godmani* and *cabanisi*) may come into contact.

2. Jaramillo:



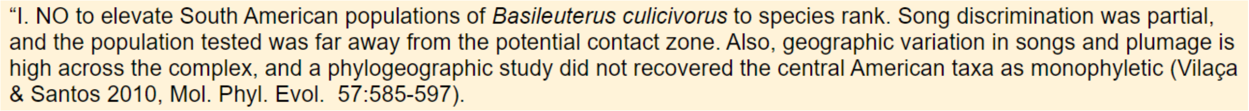
I - NO, but not because I do not believe that there are multiple species here. But this one is one of those complex ones with possibly multiple species involved, furthermore *B. hypoleucus* may in fact be conspecific with one of these forms. So, it is complicated enough that I would rather base changes on the Vilaca & Santos (2010) paper. Copy available here: https://s3.amazonaws.com/academia.edu.documents/46692562/Biogeographic_history_of_the_species_com20160621-14843-6idjqj.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1522809006&Signature=X%2FzDXcNowKX2AzmZ6ykEM8dpuNc%3D&response-content-disposition=inline%3B%20filename%3DBiogeographic_history_of_the_species_com.pdf

Later comments from Jaramillo:



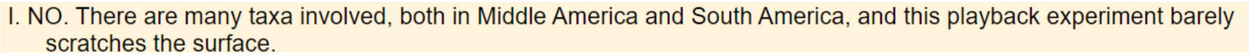
I - NO, see my previous comments. May require re-writing this one as a new proposal? More information needs to be unpacked for this one.

3. Claramunt:



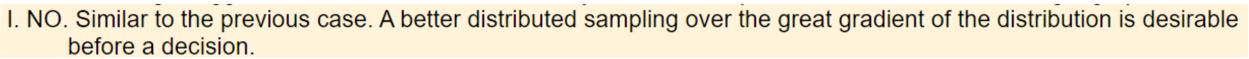
"I. NO to elevate South American populations of *Basileuterus culicivorus* to species rank. Song discrimination was partial, and the population tested was far away from the potential contact zone. Also, geographic variation in songs and plumage is high across the complex, and a phylogeographic study did not recovered the central American taxa as monophyletic (Vilaça & Santos 2010, Mol. Phyl. Evol. 57:585-597).

4. Lane:



I. NO. There are many taxa involved, both in Middle America and South America, and this playback experiment barely scratches the surface.

5. Pacheco:



I. NO. Similar to the previous case. A better distributed sampling over the great gradient of the distribution is desirable before a decision.

The Birdlife species accounts detailing the splits within *Basileuterus culicivorus* are as follows:

> *B. cabanisi* hitherto treated as conspecific with *B. culicivorus* and *B. auricapilla*, but differs from former in its grey vs olive-grey upperparts and ear-coverts (2); yellow vs orange coronal stripe (2);

> whitish vs yellow loral line, and whitish vs yellowish-olive supercilium (3); white vs yellow undertail-coverts (ns1); song a series of repeated, almost identical notes covering a very large frequency range, reaching 9–11 kHz, thus differing in its much higher maximum frequency (3) and lower number of different note shapes (2) (Boesman 2016); and from *B. auricapilla* by its grey vs olive-green upperparts and ear-coverts (3); yellow vs orange coronal stripe (2); grey vs pale buff hindcrown and nape (1); white vs yellow undertail-coverts (ns1); song with a single note shape (1) and all notes at high pitch (2). Four subspecies recognized.
>
> *B. auricapilla* hitherto treated as conspecific with *B. culicivorus* and *B. cabanisi*, but differs from latter in characters given under that species and from former in its olive-green vs olive-grey upperparts and ear-coverts (1); whitish vs yellow loral line, and whitish vs yellowish-olive supercilium (3); pale buff vs pale grey-green hindcrown and nape (1); song with initial note(s) higher-pitched (3) and most notes similar in shape (1) (Boesman 2016). Five subspecies recognized.

Basileuterus hypoleucus is not mentioned in the species accounts above because Birdlife considers it a separate species from *B. culicivorus*.

Recommendation:

Birdlife treats *Basileuterus culicivorus* as three separate species: *B. culicivorus*, *B. cabanisi*, and *B. auricapillus*. The bases for the three-species treatment are plumage coloration and vocal differences. However, mitochondrial data suggests that the *culicivorus* group (*B. culicivorus* following Birdlife) is not monophyletic, and variation in song in *B. culicivorus sensu lato*, especially within *cabanisi*, appears to be more complex than previously indicated. Playback experiments by Freeman and Montgomery (2017) are valuable in showing that different groups might not recognize each other, but song discrimination in the taxa they studied (*godmani* vs. *cabanisi*) was partial and, as noted in the SACC comments, the vocalizations used were of unknown provenance. The playback experiments offer a glimpse of the variation among subspecies of the widespread *B. culicivorus*, and should motivate further studies with better geographic representation. Subspecies *godmani* was not included in the phylogeographic study from Vilaça and Santos (2010), and it is unknown how it relates to other subspecies within the *culicivorus* group, and the species as a whole. The information currently available is insufficient to support a split between *cabanisi* and *auricapillus*, considering that differences in voice between the two groups may be clinal.

Both SACC and NACC merged *B. hypoleucus* with *B. culicivorus* some ten years ago, a merger supported by various lines of evidence (i.e., playback experiments, lack of vocal and genetic differentiation, mixed pairs, and intermediates in contact zones). Although Birdlife considers *B. hypoleucus* and *B. culicivorus* to be separate species, the SACC-NACC merger from 2012 should not be in question unless new information becomes available.

This proposal consists of the following subproposals:

a. Split the Mexican-Central American populations (*culicivorus* group) from the South American populations (*cabanisi*, *auricapillus*, *hypoleucus* groups). This subproposal is the one most relevant to the NACC. If voting YES on subproposal (a), you can continue to vote on subproposals (b) and (c), but these are SACC issues, and any NACC votes would be strictly for information only.

b. If *a* passes, split the *cabanisi* group from *auricapillus* and *hypoleucus*.
c. If *a* and *b* pass, split *auricapillus* from *hypoleucus*.

We recommend voting NO on the three splits. Phylogeographic studies that consider the widespread geographic range of *Basileuterus culicivorus* are needed, as are more comprehensive vocal analyses and additional playback experiments between the morphological groups and subspecies, especially at contact zones.

English names:

The following English names are currently used for the four groups:

(1) *culicivorus* – Stripe-crowned Warbler.
(2) *cabanisi* – Cabanis's Warbler or Yellow-crowned Warbler.
(3) *auricapillus* – Golden-crowned Warbler.
(4) *hypoleucus* – White-bellied Warbler.

New proposals for the English names would be necessary in the following cases:

- If (a) passes and (b) and (c) do not, a new English name would be required for the South American populations, which would then become *Basileuterus auricapillus*.
- If (a) and (b) pass but (c) does not, a new English name would be necessary for the group pair *auricapillus* and *hypoleucus*.

Literature cited:

American Ornithologists' Union. (1998). Check-list of North American birds. 7th edition.

Boesman, P. (2016). Notes on the vocalizations of Golden-crowned Warbler (*Basileuterus culicivorus*). HBW Alive Ornithological Note 380. In: Handbook of the Birds of the World Alive. Lynx Edicions, Barcelona. https://doi.org/10.2173/bow-on.100380

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Phelps, J., A. M. Contreras-González, C. I. Rodríguez-Flores, C. A. Soberanes-González, M. d. C. Arizmendi, and A. Jaramillo. (2020). Golden-crowned Warbler (*Basileuterus culicivorus*), version 1.0. In Birds of the World (T. S. Schulenberg, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.gcrwar.01

Vilaça, S. T. and F. R. Santos. (2010). Biogeographic history of the species complex *Basileuterus culicivorus* (Aves, Parulidae). Molecular Phylogenetics and Evolution 57:585-597.

Submitted by: Rosa Alicia Jiménez**,** Universidad de San Carlos de Guatemala, and Terry Chesser

Proposal date: 6 May 2022

Treat Greater Antillean Nightjar *Antrostomus cubanensis* as two species

Background:

The Cuban Nightjar (*Antrostomus cubanensis*) has been treated by AOU (1983, 1998) as a polytypic species, the nominate subspecies on Cuba and *A. c. ekmani* on Hispaniola. The nominate subspecies was described from Cuba by Lawrence in 1860, the type locations being Cienega de Zapata and the coast of Manzanillo, Cuba. The Hispaniolan taxon *ekmani* was described as a species by Lönnberg in 1929 but was treated as a subspecies of *cubanensis* soon thereafter (e.g., by Wetmore and Swale 1931 and Peters 1940). Most subsequent authors followed this treatment until the 1990s. However, the notes for *Caprimulgus cubanensis* in the 7th edition of the Checklist (AOU 1998) stated that **"**Differences in vocalizations (Hardy et al. 1988) suggest that the two groups may represent separate species, *C. cubanensis* [Cuban Nightjar] and *C. ekmani* (Lönnberg, 1929) [Hispaniolan Nightjar]."

A third subspecies, *A. c. insulaepinorum*, was described from the southern part of Isla de Juventud, Cuba, by Garrido (1983) on the basis of smaller size, shorter tail, and much darker coloration, especially on the pileum, back, breast and wing coverts; barring on rectrices and primaries; and narrower and darker primaries. Garrido (1983) considered the birds from the Zapata Peninsula to be intermediate. However, Kirkconnell et al. (2020) noted that the characters used to describe the new subspecies were not consistent and suggested that "should additional material become available, in series, neither size nor color characters will prove to be conclusive discriminates." They also pointed out that Dickinson and Remsen (2013) did not recognize *insulaepinorum*.

New Information:

Garrido and Reynard (1998) compared vocalizations of *cubanensis* and *ekmani* based on recordings they made from Cuba (n=16), the southern part of Isla de Juventud (n=1), and Hispaniola (n=11, all from the Dominican Republic). They concluded that the vocal differences supported species status for *ekmani*. They described the territorial song of Cuban birds as "a rather harsh buzzy sound with rising and falling pitch. It is unbroken, but gives the impression of four syllables, rather than the three suggested by the local common name, Guabairo. It might be paraphrased as "*Gua bai ah ro*"." They also noted that the song has an overall drop in pitch. Range for the length of the song phrases was 0.5-0.7 seconds, phrases were delivered every 1.0-1.2 seconds, and typical frequency range was 1.15-1.35 kHz. The territorial song of *ekmani*, in contrast, was found to have an overall rise in pitch, and they noted that the nature of the song is reflected in the common name "Pitangúa", "recognizing the distinct, separate "*click*'" in the "*pit*" part of the name, not present in any of the 16 individuals' songs recorded in Cuba proper." Garrido and Reynard (1998) also noted that the harmonics are ca. 100 to 250 Hz higher in *ekmani* and that the song phrases are longer, averaging 1.0-1.5 seconds as opposed to 0.5-0.7 seconds. Figure 1 shows their sonograms of typical territorial songs from *cubanensis* and *ekmani* (panels A and C) as well as a song from *cubanensis insulaepinorum* (panel B) and an atypical song from *ekmani* (panel D):

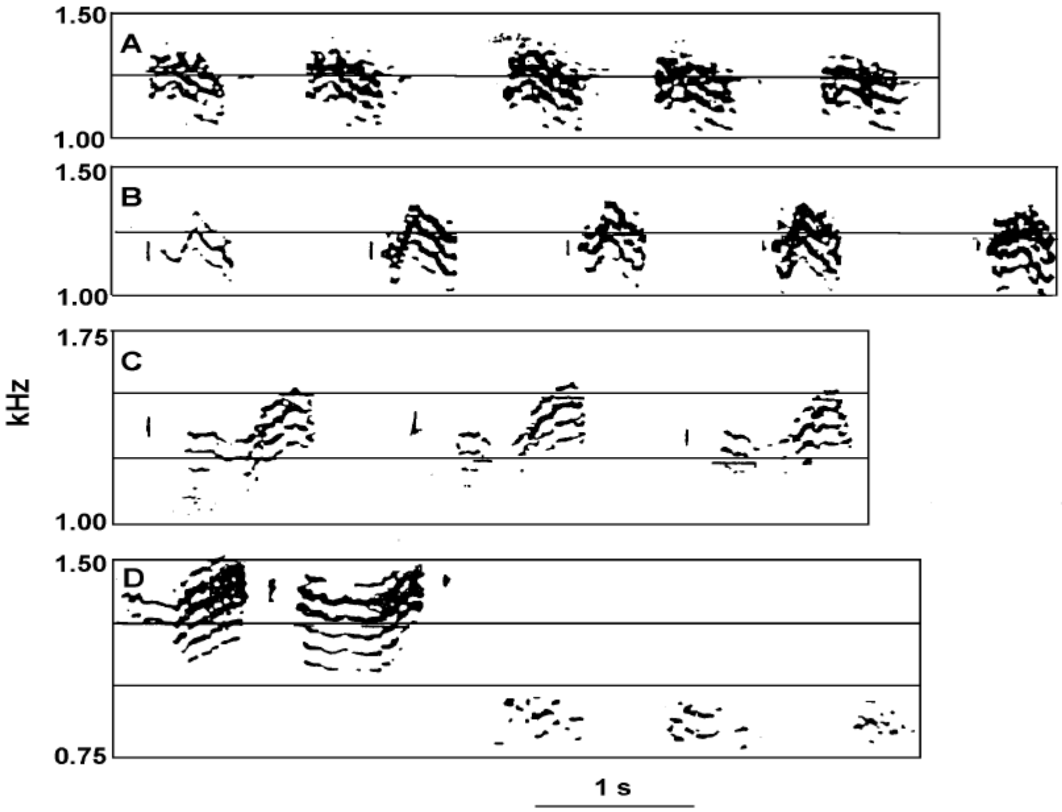


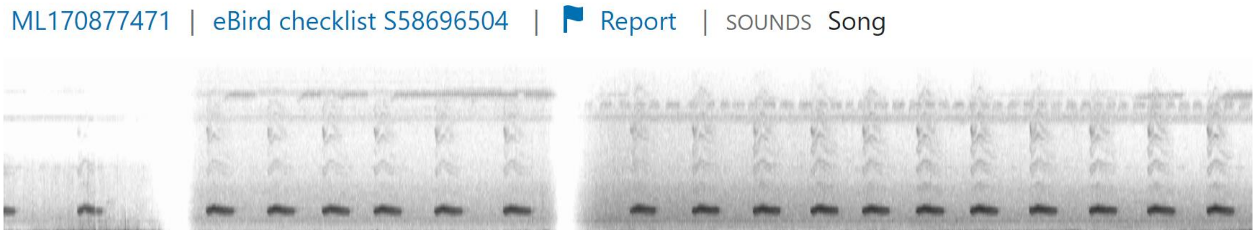
FIG. 1. Song of *Caprimulgus*. A) Characteristic territorial song phrases from Cuba; B) The only song example obtained from the Isle of Youth; C) Territorial song phrases from the Dominican Republic; and D) A modified breeding season vocalization from the Dominican Republic (accelerated phrase delivery, interrupted in a pause, and continued with low-pitched “*gaaws*”; the original 3-s pause is reduced here to c. 0.3 s).

Garrido and Reynard (1998) also provided descriptions of calls, which are similar, and of plumage differences between *cubanensis* and *ekmani*: more extensive beige or whitish patches on the rectrices in *ekmani*, lack of barring or other markings on the undertail coverts of *ekmani*, less conspicuous (“practically indistinguishable”) buffy collar in *ekmani*, and wider black streaks on the crown in *ekmani*.

Many authors (Cleere and Nurney 1998, Cleere 2010, Navarro 2015, Raffaele et al. 2019, Kirkconnell et al. 2020) subsequently treated these taxa as separate species, although others (e.g., Holyoak 2001, Keith et al. 2003, Dickinson and Remsen 2013) continued to consider them conspecific. Both the IOC checklist and the HBW-Birdlife checklist treat them separate species; eBird/Clements, following us, considers them conspecific.

Authors recognizing *ekmani* as a separate species have emphasized the differences in vocalizations. Cleere and Nurney (1998), for example, summarized the primary song of *cubanensis* as “a short, evenly pitched, trilled whistle *terrrrro*” and of *ekmani* as “the song consists of a short *click* or *tuc* followed by a trilled whistle, rising in pitch before trailing off.” On the basis of personal experience (JD), these statements describe the songs well. Both taxa give “chuck” “tuck” type call notes which seem to be found in many species of nightjars. Xeno-canto only has one recording of *A. cubanensis* (subspecies *insulaepinorum*), whereas Macaulay Library has 16 recordings. Examples of the songs of *cubanensis* and *ekmani* are provided below.

A. c. cubanensis, Ciego de Avila, Cuba:



ML170877471 | eBird checklist S58696504 | Report | SOUNDS Song

A. c. ekmani, Pedernales, Dominican Republic:

ML162711741 | eBird checklist S51909929 | Report | SOUNDS Song

There appear to be no genetic data on either *cubanensis* or *ekmani*. Molecular phylogenetic studies of nightjars (e.g., Mariaux and Braun 1996, Larsen et al. 2007, Han et al. 2010) did not include *Antrostomus cubanensis*.

Antrostomus cubanensis is typically shown as occurring throughout Cuba, but personal experience (JD) suggests that it is more local. Furthermore, Kirkconnell et al. (2020) stated that “In the modern-day, *A. cubanensis* is considered a strict Cuban endemic, but fossil material is available from late Pleistocene deposits on Abaco, in the northern Bahamas (Steadman et al. 2015).” The current range of *ekmani* includes the western third of the Dominican Republic and the western part of the Tiburon Peninsula, Haiti. it was formerly widespread in the Dominican Republic and presumably in Haiti as well. It is now very rare in the eastern portion of the Dominican Republic. The type specimen was taken in Haiti.

Recommendation:

We recommend treating *ekmani* as a separate species based on the vocal differences between *ekmani* and *cubanensis*. Vocalizations, especially songs, of night birds are obviously of major importance in species recognition. Despite the rather minor plumage differences, the different songs tip the balance fairly strongly towards separate species status.

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Date of proposal: 7 May 2022

Submitted by: Jonathan Dunn, Carla Cicero, and Terry Chesser

Treat Olive-crowned Yellowthroat *Geothlypis semiflava* as two or three species

Description of the problem:

Geothlypis semiflava comprises three allopatric populations, each currently treated as a subspecies (Chesser et al. 2018, Curson et al. 2022). The nominate *semiflava* is found in the Choco of western Colombia and Ecuador, *bairdi* on the Caribbean coast of Central America from eastern Honduras to western Panama, and *chiriquensis* in a limited area on the Pacific coast of southwestern Costa Rica and western Panama (Curson et al. 2022). The latter two taxa are separated by the Talamanca Mountains. As with many other yellowthroats, the species is found in marshes and similar scrubby habitats throughout its range.

Each of the three taxa was described as a species as follows: *Geothlypis semiflava* Sclater, 1860; *Geothlypis chiriquensis* Salvin, 1872; and *Geothlypis bairdi* Nutting, 1884. Ridgway (1902) considered *chiriquensis* a species but noted that it was similar to *G. aequinoctialis velata*, differing only in a more extensively black forehead. Ridgway (1902) considered *bairdi* to be a subspecies of *semiflava*, noting that few morphometric characters differed between the two: namely a shorter tail, shorter tarsus, and larger bill in *bairdi*. Hellmayr (1935) considered *chiriquensis* a subspecies of *aequinoctialis,* noting that *chiriquensis* resembled *G. aequinoctialis velata* of southern South America and listing some seemingly minor plumage differences between the two taxa. Peters (1968) maintained the conspecific treatment of *semiflava* and *bairdi*, but elevated *chiriquensis* to species. However, a footnote from George H. Lowery and Burt L. Monroe stated that *chiriquensis* may be conspecific with *aequinoctialis*. Later authors maintained *chiriquensis* as a subspecies of *aequinoctialis* and *bairdi* as a subspecies of *semiflava* (e.g., Wetmore et al. 1984, Clements 2007, Dickinson & Christidis 2014), until Escalante et al. (2009) found that *chiriquensis* was distantly related to *aequinoctialis* and was embedded within *G. semiflava* as sister to *bairdi*. Following Chesser et al. (2018), Clements (Updates & Corrections – August 2018; https://www.birds.cornell.edu/clementschecklist/updates-corrections-2018/) considered *chiriquensis* as a subspecies of *semiflava*, whereas HBW-BirdLife (2014) treated each of the three taxa (*semiflava, bairdi,* and *chiriquensis*) as species. Below is the HBW-BirdLife reasoning for elevating the three taxa to the species level:

> *G. chiriquensis* [note that these morphological/vocal characters are given in contrast to subspecies of *aequinoctialis*, not *semiflava*]*:* usually considered conspecific with *G. aequinoctialis*, but is genetically distant (1) and differs from that species and *G. auricularis* by its small size (at least 1) albeit slightly longer bill (allow 1); greater extent of black on forecrown (score 2 vs *aequinoctialis*, 3 vs *auricularis*); much longer song (3), starting uniquely with a subphrase repeated several times (2) and continuing with a gradual acceleration (pace increase: ns[2]); and unique long call (or alternative song), a long fast rattle initially descending in pitch (ns[2]) (2). Monotypic.
>
> *G. bairdi*: hitherto treated as conspecific with *G. semiflava*, but is genetically closer to *G. chiriquensis* (1); differs from *semiflava* by its darker (more brown-tinged) olive

> upperparts, most obviously on rump and tail (1); possibly broader olive flanks, confining yellow underparts to narrower strip (ns); slightly longer bill (effect size 1.69, score 1); shorter tail (effect size –2.25, score 2); song sometimes a five-second strophe of clearly articulated, repeated notes, but also an ebullient rattling even-pitched warbling at higher speed, much more protracted (2) and with a unique dry rattle incorporated (3), vs a strophe of clearly articulated, repeated notes, lasting c. 5 seconds, slightly accelerating and commonly descending in pitch (2). Monotypic.

The NACC considered the transfer of *chiriquensis* from *G. aequinoctialis* to *G. semiflava* in proposal 2018-A-3 (Chesser et al. 2018), which passed with strong support.

As for morphological differences, *bairdi* and *semiflava* are broadly similar, males of which both have a well-defined black mask that lacks a gray border, while *chiriquensis* has a distinct gray border above the black mask and is similar to *G. aequinoctialis* in this regard. Curson et al. (2022) noted the following characters: “Subspecies *bairdi* differs from nominate *semiflava* by its darker (more brown-tinged) olive upperparts, most obviously on rump and tail, slightly longer bill, and possibly broader olive flanks that confine the yellow underparts to a narrower strip”, and for *chiriquensis*: “Adult male has lores, forecrown, orbital ring and face-sides black, crown and line from rear of eye to nape gray”. Females of *bairdi* and *semiflava* are largely yellow below and olive above, while females of *chiriquensis* have the auriculars and crown replaced with gray (photos in Macaulay library).

In considering *bairdi* to be a subspecies of *semiflava*, Ridgway (1902) had only a single specimen of *semiflava* to examine, but a footnote (pasted below) indicates that the two taxa are extremely similar, and Ridgway was doubtful that *bairdi* was distinct enough from *semiflava* to even maintain it as a subspecies:

> “I continue to separate the Central American bird from true *G. semiflava* of Ecuador, at least provisionally. All the Central American specimens examined differ from the single Ecuadorean skin available for comparison in shorter tail and tarsus and larger bill, as mentioned above; furthermore, the Ecuadorean specimen has the posterior extremity of the black mask continued along each side of the lower throat for a considerable distance, and almost forming a collar across the upper chest. Among the five adult males from Central America only one shows the slightest approximation to this last-mentioned character. Otherwise, they are all very much like the specimen from Ecuador, and it may be that a series of specimens from the latter country would show that no constant difference really exists, in which case the alleged Central American subspecies could not, of course, be maintained.”

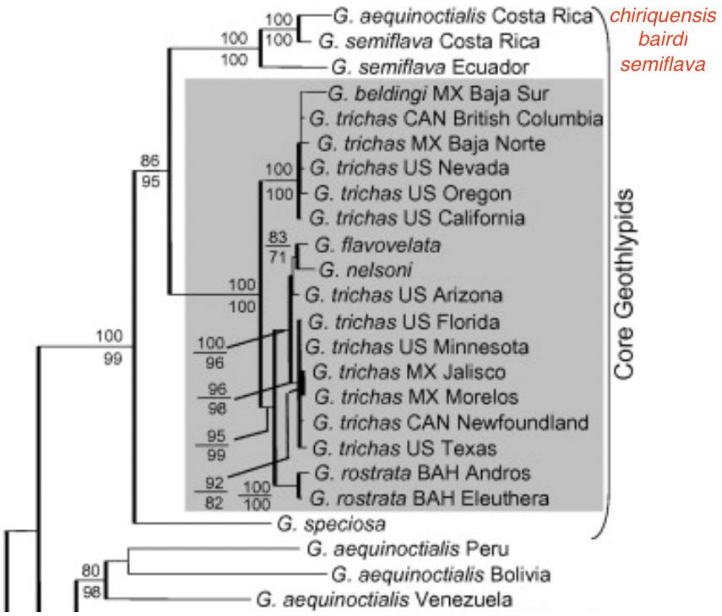
We reviewed photos of the two taxa online and found the extent of black was similar between the two taxa, but some individuals of *semiflava* (e.g. https://macaulaylibrary.org/asset/54813251) did show the more extensive dark on the sides of the lower throat mentioned by Ridgway. A comprehensive review and analysis of specimens is necessary.

In listening to recordings of the three taxa, all sound broadly like other *Geothlypis*, with the rapid repeated up-and-down sweet phrases typical of the genus. Searching for differences, *bairdi* may accelerate more towards the end of the song, and some recordings contain inserted buzzy notes. *Chiriquensis* sounds higher pitched and has a more rapid delivery. The call of all three taxa is a short squeaky descending note. Many recordings of all three taxa are available online, but as far as we are aware, the differences have not been quantified, other than the scores based on qualitative descriptions in the HBW-BirdLife accounts quoted above:
https://xeno-canto.org/species/Geothlypis-chiriquensis
https://xeno-canto.org/species/Geothlypis-semiflava
https://media.ebird.org/catalog?taxonCode=olcyel1&mediaType=audio&view=list&sort=rating_rank_desc

New information:

The Working Group on Avian Checklists (WGAC) is reconciling world bird lists, and the discrepancy between HBW-BirdLife (2014) and the NACC/Clements lists with regard to *G. semiflava* is one of these that will be considered. Although the NACC voted to transfer *chiriquensis* from *G. aequinoctialis* to *G. semiflava* in 2018, the committee did not at the time explicitly consider whether to elevate *semiflava*, *bairdi*, and *chiriquensis* to species rank, which is the focus of this proposal. The following data were voted on in 2018-A-3, but are included here for reference.

Escalante et al. (2009) sampled one individual from each of the three taxa, using 2,800 base pairs of mitochondrial DNA (genes: ND2, cyt-*b*, and mitochondrial control region). The topology of the relevant part of the tree is below, with the three taxa under consideration labeled by their current subspecies names in red. The section of the figure caption describing the support values is here: “Numbers shown above nodes indicate the results of 200 ML bootstrap replicates



(TREEFINDER) and those below reflect 200 replicates using weighted MP [=Maximum Parsimony] (3rd position transversions ×5)".

Note that *chiriquensis* and *bairdi* are sister taxa in this mitochondrial tree, with *semiflava* sister to those two. The uncorrected cyt-*b* distance between *semiflava* and *chiriquensis*+*bairdi* is 2.5% (Escalante et al. 2009). Proposal 2018-A-3 listed the mitochondrial distance between *chiriquensis* and *bairdi* as 0.4%, but that does not appear to be listed in Escalante et al. (2009), so it is unclear where that value was obtained. However, *chiriquensis* and *bairdi* are clearly closely related based on the short branch lengths separating the two taxa in the figure above. Alternatively, the close mitochondrial relationship between *bairdi* and *chiriquensis* could be due to recent hybridization, but nuclear DNA data would be necessary to address this.

Freeman and Montgomery (2017) conducted playback trials between allopatric taxa of suboscines and oscines, and included *chiriquensis* and *bairdi* in the study (then considered different species). They found that the two taxa responded strongly to songs of the other: seven of the eight *bairdi* responded strongly to song playback of *chiriquensis*. This response ranked as one of the stronger inter-taxon responses from their sample of 72 species pairs. Figure 2 from Freeman and Montgomery (2017) is shown below, and the values for *chiriquensis* vs. *bairdi* are: Behavioral discrimination = 0.13, Standardized acoustic divergence = 1.66.

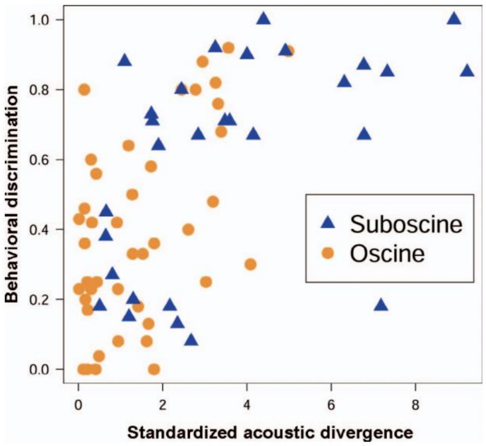


FIGURE 2. Standardized acoustic divergence is nonlinearly related to behavioral song discrimination in a dataset of 72 taxon pairs. Suboscines tend to have greater standardized acoustic divergences and behavioral discrimination values than oscines, but the 2 clades have the same nonlinear relationship between standardized acoustic divergence and behavioral song discrimination—a Michaelis-Menten model without clade identify is a better fit than a model that includes clade identity ($F = 0.95$, df = 1, $P = 0.33$). In both clades, song discrimination is nearly uniformly high when standardized acoustic divergence is greater than ~3, and highly variable at low levels of standardized acoustic divergence. Song discrimination is the percentage of territories in a population that failed to approach the speaker in response to playback of its allopatric taxon pair (i.e. song discrimination scores >0.5 indicate taxon pairs in which the majority of territories discriminated against allopatric song), and standardized acoustic divergence is the distance between population means along PC1 within a taxon pair, expressed in pooled standard deviations. The outlier taxon pair in the bottom right (high acoustic divergence but low discrimination) is Yellowish Flycatcher (*Empidonax flavescens*)–Cordilleran Flycatcher (*E. occidentalis*).

Boesman (2016) qualitatively assessed the vocal differences between *bairdi* and *semiflava*, but because *chiriquensis* was not at the time considered a subspecies of *semiflava*, that taxon was not considered in the comparison. The primary song differences found by Boesman (2016) were the insertion of a dry rattle in the song of *bairdi*, and an overall descending quality to the song of *semiflava*, resulting in a Tobias score of 5. However, an examination of recordings of *bairdi* songs on xeno-canto and Macaulay Library showed that only 14 of 22 individuals consistently inserted the dry rattle into their songs, whereas 7 consistently did not. One individual inserted the rattle only in the fourth and succeeding songs of its recording, on a recording that stated that there were both natural and playback-induced songs. These findings suggest that the context and function of the rattle and whether it is important in species recognition are subject to question. Although Boesman (2016) found high vocal divergence between *bairdi* and *semiflava*, and Freeman and Montgomery (2017) low vocal divergence and behavioral response between *bairdi* and *chiriquensis*, a pattern mirroring that found in the mitochondrial DNA, the vocal difference between *bairdi* and *semiflava* appears to be less consistent and perhaps less significant than previously thought.

Effect on AOS-CLC area:

Elevating all three taxa to species rank would result in one additional species for the AOS area (and diminishment of the current South American *G. semiflava* by two subspecies and part of its currently recognized range). Splitting the combined *bairdi* + *chiriquensis* from *semiflava* would add no species to the AOS area, as *semiflava* is extralimital to the AOS area.

Recommendation:

We recommend a **NO** vote on any splits to this group. Vocal, plumage, and mitochondrial DNA evidence are suggestive of species-level differences, but conflict regarding where those differences are greatest. We suggest that a comprehensive analysis of all of these traits in all three taxa is needed. The strongest evidence for a split may be for separating nominate *semiflava* from a combined *bairdi* + *chiriquensis* (YES on 3 below). The moderate mitochondrial divergence (Escalante et al. 2009) combined with moderate vocal divergence (Boesman 2016) between *semiflava* and *bairdi* suggests that these two populations have been evolving independently for some time. However, this would result in a combined *bairdi* + *chiriquensis* that differ greatly in plumage but would keep *bairdi* and *semiflava* in different species, despite the latter two being nearly identical in plumage (see comments on plumage in Ridgway 1902, above). This issue could be circumvented by further elevating both *bairdi* and *chiriquensis* to species rank (YES on 1, 2, & 3 below), a route advocated for by HBW-BirdLife (2014), but the playback evidence from Freeman and Montgomery (2017) suggests that *bairdi* and *chiriquensis* are best considered conspecific despite the plumage differences.

The genetic data are based solely on mitochondrial loci, and only a single sample per taxon. The genetic distance (2.5%) between *semiflava* and the two Central American taxa is intriguing but insufficient for species status on its own; mtDNA distance is known to be a poor indicator of biological species limits (but see arguments above). Divergence in oscine song (which is learned) is also less reliable than in suboscines, and in this case the playback data show that *bairdi* and *chiriquensis* respond to each other's song quite strongly. Playback data are lacking for the more distantly related *semiflava*, but even that would be unlikely to be definitive, given high levels of case-by-case variation using this methodology and other issues (e.g., Parker et al. 2018, Winker 2021). In the comments for 2018-A-3, a NACC member noted that some *Geothlypis* species are generally responsive to playback and "pishing", so the elevated playback response between *bairdi* and *chiriquensis* may simply be because of general responsiveness of *Geothlypis* to playback, rather than indicative of conspecific status. Freeman and Montgomery (2017) likewise considered a lack of response to be a good indicator of species status, but noted that a strong response may not be a good indicator of conspecific status.

Considering, then, the plumage and morphometric data, *chiriquensis* is the most distinct of the three taxa, as evidenced by its historical treatment as a subspecies of *aequinoctialis*. The gray border to the face mask of the male and the extensive gray on the head of the female is quite distinct from that of *bairdi* and *semiflava*. This plumage divergence suggests that *chiriquensis* could be considered as a distinct species (YES on 1 below). However, based on the genetic data, splitting this taxon would render *semiflava* mitochondrially paraphyletic, and the mitochondrial DNA divergence between *chiriquensis* and *bairdi* is very low. This may not be an issue, given gene-tree/species-tree issues relevant to mitochondrial DNA (and species level monophyly in general). Data from the nuclear genome could be quite different from that of the mitochondrial DNA, but these data are not available. The plumage differences between *bairdi* and *semiflava* are weak, and are largely from differing shades of olive and brown in the dorsum and flanks, although this latter mark is not very apparent in photos. The bill and tail lengths differ slightly. See details in Ridgway (1902), HBW-BirdLife (2014), and Curson et al. (2022) above for plumage, vocal, and morphometric differences.

Please vote on the following:

1) elevate *chiriquensis* to species rank
2) elevate *bairdi* to species rank
3) treat a combined *chiriquensis* + *bairdi* as a species separate from *semiflava*. Here, *chiriquensis* would take priority, with *bairdi* as a subspecies.

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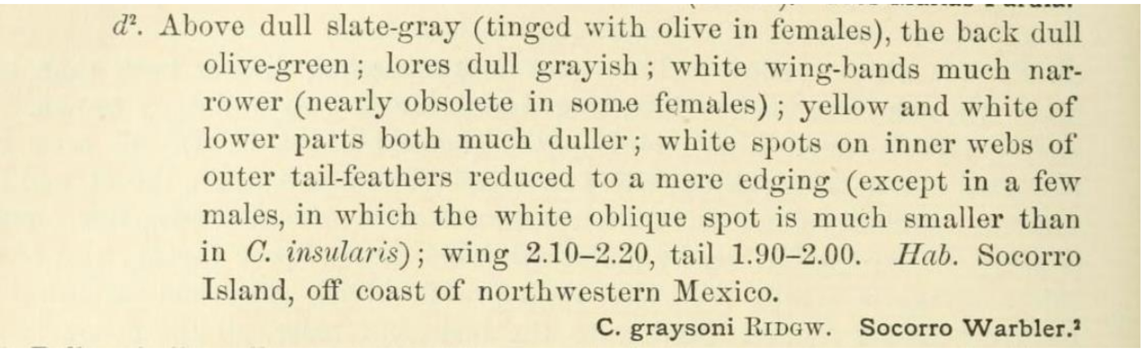
Submitted by: Oscar Johnson, The University of Texas at El Paso; Kevin Winker, University of Alaska Fairbanks; and Terry Chesser

Date of proposal: 10 May 2022

Treat *Setophaga graysoni* as a separate species from Tropical Parula *S. pitiayumi*

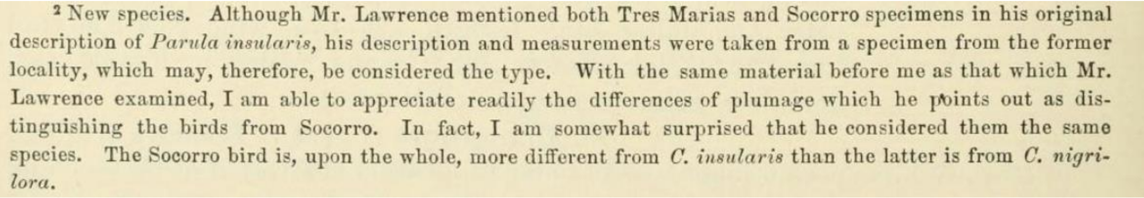
Description of the problem:

The Tropical Parula *Setophaga pitiayumi* includes several subspecies, some of which differ strongly in vocalizations as well as exhibiting variation in plumage. The Socorro Island form *graysoni* is the most distinctive in plumage, with both sexes being drab and resembling immatures of other forms, and also lacking or nearly lacking any white in tail. The Socorro taxon was initially considered the same form as that on the Tres Marías Islands, described as *insularis* by Lawrence, 1871, and this treatment was followed by subsequent authors (see Hellmayr 1935:351), until Ridgway (1887) recognized the differences and described *graysoni*, as follows:



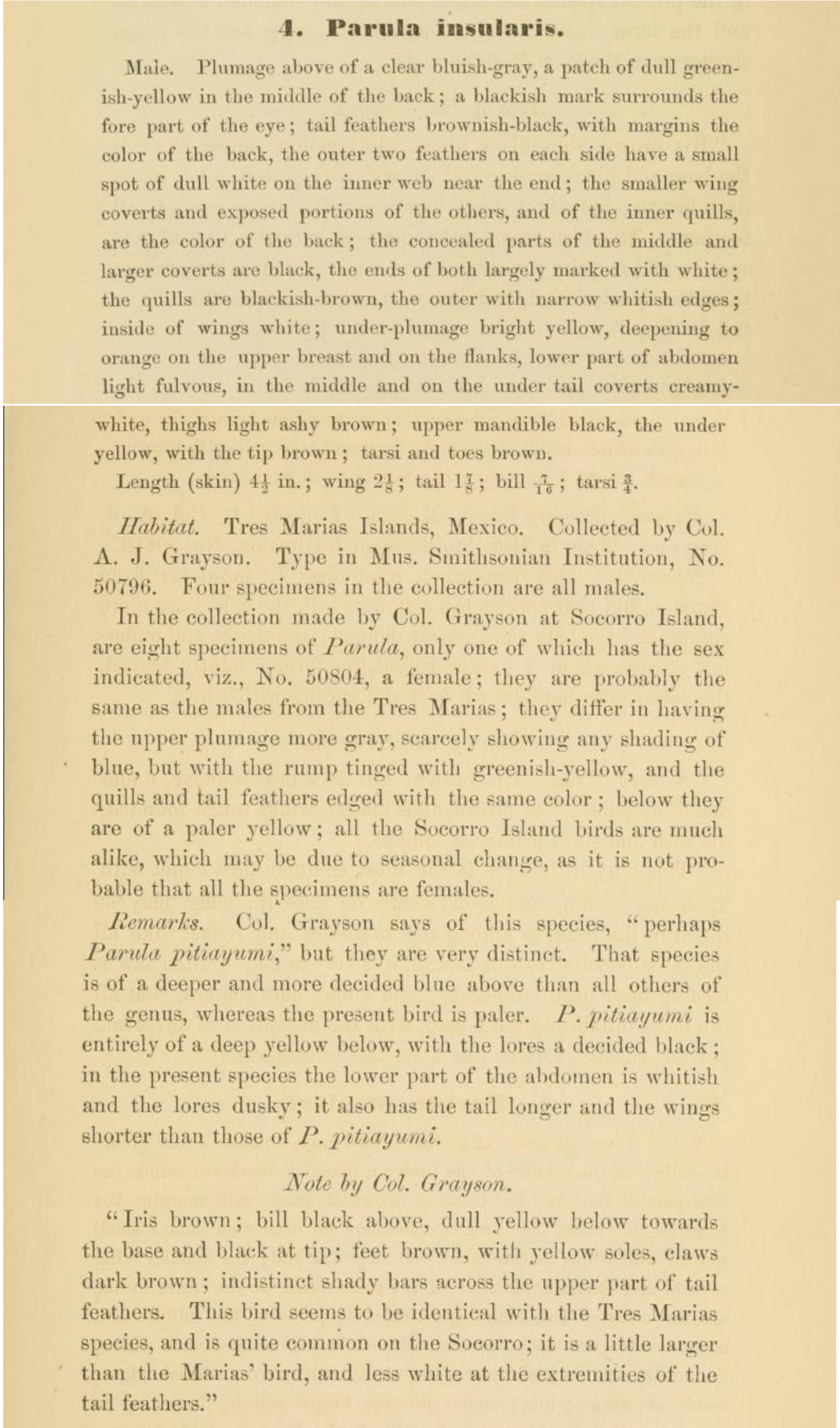
d^2. Above dull slate-gray (tinged with olive in females), the back dull olive-green; lores dull grayish; white wing-bands much narrower (nearly obsolete in some females); yellow and white of lower parts both much duller; white spots on inner webs of outer tail-feathers reduced to a mere edging (except in a few males, in which the white oblique spot is much smaller than in *C. insularis*); wing 2.10–2.20, tail 1.90–2.00. *Hab.* Socorro Island, off coast of northwestern Mexico.

C. graysoni RIDGW. **Socorro Warbler.**[2]



[2] New species. Although Mr. Lawrence mentioned both Tres Marias and Socorro specimens in his original description of *Parula insularis*, his description and measurements were taken from a specimen from the former locality, which may, therefore, be considered the type. With the same material before me as that which Mr. Lawrence examined, I am able to appreciate readily the differences of plumage which he points out as distinguishing the birds from Socorro. In fact, I am somewhat surprised that he considered them the same species. The Socorro bird is, upon the whole, more different from *C. insularis* than the latter is from *C. nigrilora*.

Although Ridgway expressed surprise at Lawrence's (1871) failure to name the Socorro bird, the type series of *graysoni* (in USNM) was comprised of eight specimens when examined by Lawrence [of which two were missing by the time Deignan (1961) examined them], and all but one female were unsexed. In fact, Lawrence (1871) correctly noted some differences between the then-unnamed *graysoni* and his *insularis*, but tentatively attributed them to seasonal change. In addition, he appended the by-then late Grayson's notes, which curiously stated both that the Socorro bird is identical with that of the Tres Marías, but also noted two of their differences (see below, from Lawrence 1871).



4. Parula insularis.

Male. Plumage above of a clear bluish-gray, a patch of dull greenish-yellow in the middle of the back; a blackish mark surrounds the fore part of the eye; tail feathers brownish-black, with margins the color of the back, the outer two feathers on each side have a small spot of dull white on the inner web near the end; the smaller wing coverts and exposed portions of the others, and of the inner quills, are the color of the back; the concealed parts of the middle and larger coverts are black, the ends of both largely marked with white; the quills are blackish-brown, the outer with narrow whitish edges; inside of wings white; under-plumage bright yellow, deepening to orange on the upper breast and on the flanks, lower part of abdomen light fulvous, in the middle and on the under tail coverts creamy-white, thighs light ashy brown; upper mandible black, the under yellow, with the tip brown; tarsi and toes brown.

Length (skin) $4\frac{1}{2}$ in.; wing $2\frac{1}{8}$; tail $1\frac{7}{8}$; bill $\frac{7}{16}$; tarsi $\frac{3}{4}$.

Habitat. Tres Marias Islands, Mexico. Collected by Col. A. J. Grayson. Type in Mus. Smithsonian Institution, No. 50796. Four specimens in the collection are all males.

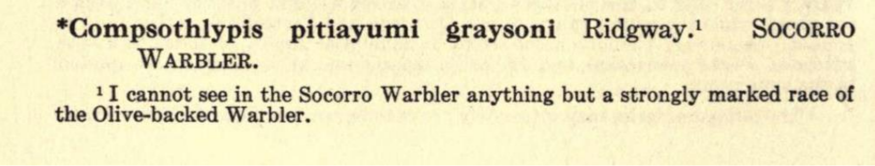
In the collection made by Col. Grayson at Socorro Island, are eight specimens of *Parula*, only one of which has the sex indicated, viz., No. 50804, a female; they are probably the same as the males from the Tres Marias; they differ in having the upper plumage more gray, scarcely showing any shading of blue, but with the rump tinged with greenish-yellow, and the quills and tail feathers edged with the same color; below they are of a paler yellow; all the Socorro Island birds are much alike, which may be due to seasonal change, as it is not probable that all the specimens are females.

Remarks. Col. Grayson says of this species, "perhaps *Parula pitiayumi*," but they are very distinct. That species is of a deeper and more decided blue above than all others of the genus, whereas the present bird is paler. *P. pitiayumi* is entirely of a deep yellow below, with the lores a decided black; in the present species the lower part of the abdomen is whitish and the lores dusky; it also has the tail longer and the wings shorter than those of *P. pitiayumi*.

Note by Col. Grayson.

"Iris brown; bill black above, dull yellow below towards the base and black at tip; feet brown, with yellow soles, claws dark brown; indistinct shady bars across the upper part of tail feathers. This bird seems to be identical with the Tres Marias species, and is quite common on the Socorro; it is a little larger than the Marias' bird, and less white at the extremities of the tail feathers."

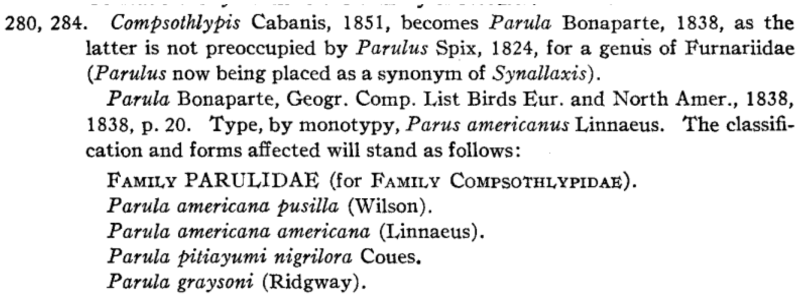
Hellmayr (1935), with the following footnote, lumped *graysoni* into *pitiayumi*.



***Compsothlypis pitiayumi graysoni** Ridgway.[1] SOCORRO WARBLER.

[1] I cannot see in the Socorro Warbler anything but a strongly marked race of the Olive-backed Warbler.

Based on two specimens collected in Baja California (Lamb 1925), *graysoni* was added as a species to the AOU Check-list in the 4th edition (1931). The A.O.U. continued to consider *graysoni* specifically distinct in the 22nd Supplement (AOU 1947, below), *contra* the implication in Deignan (1961) that it was lumped in that Supplement:

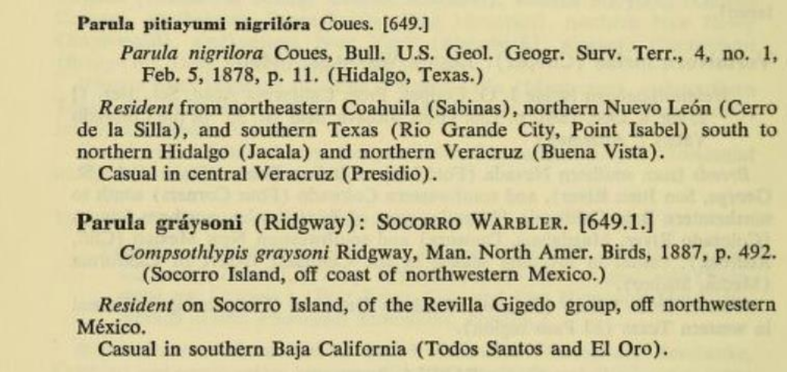


280, 284. *Compsothlypis* Cabanis, 1851, becomes *Parula* Bonaparte, 1838, as the latter is not preoccupied by *Parulus* Spix, 1824, for a genus of Furnariidae (*Parulus* now being placed as a synonym of *Synallaxis*).

Parula Bonaparte, Geogr. Comp. List Birds Eur. and North Amer., 1838, 1838, p. 20. Type, by monotypy, *Parus americanus* Linnaeus. The classification and forms affected will stand as follows:

FAMILY PARULIDAE (for FAMILY COMPSOTHLYPIDAE).
Parula americana pusilla (Wilson).
Parula americana americana (Linnaeus).
Parula pitiayumi nigrilora Coues.
Parula graysoni (Ridgway).

The 5th Edition (AOU 1957) also retained *graysoni* as a species,



Parula pitiayumi nigrilóra Coues. [649.]

Parula nigrilora Coues, Bull. U.S. Geol. Geogr. Surv. Terr., 4, no. 1, Feb. 5, 1878, p. 11. (Hidalgo, Texas.)

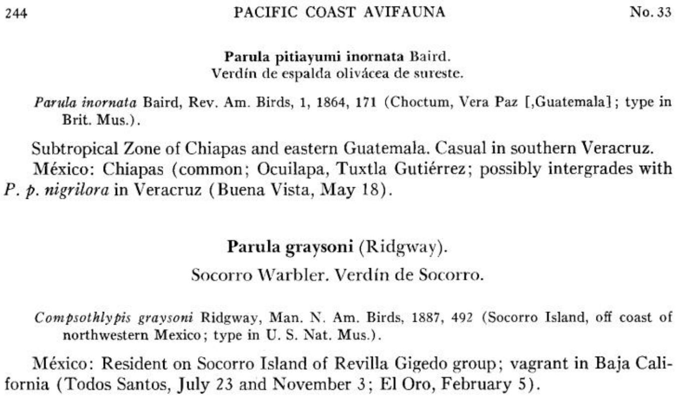
Resident from northeastern Coahuila (Sabinas), northern Nuevo León (Cerro de la Silla), and southern Texas (Rio Grande City, Point Isabel) south to northern Hidalgo (Jacala) and northern Veracruz (Buena Vista).
Casual in central Veracruz (Presidio).

Parula gráysoni (Ridgway): SOCORRO WARBLER. [649.1.]

Compsothlypis graysoni Ridgway, Man. North Amer. Birds, 1887, p. 492. (Socorro Island, off coast of northwestern Mexico.)

Resident on Socorro Island, of the Revilla Gigedo group, off northwestern México.
Casual in southern Baja California (Todos Santos and El Oro).

as did Friedmann et al. (1957, below):



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Parula pitiayumi inornata Baird.
Verdín de espalda olivácea de sureste.

Parula inornata Baird, Rev. Am. Birds, 1, 1864, 171 (Choctum, Vera Paz [,Guatemala]; type in Brit. Mus.).

Subtropical Zone of Chiapas and eastern Guatemala. Casual in southern Veracruz.

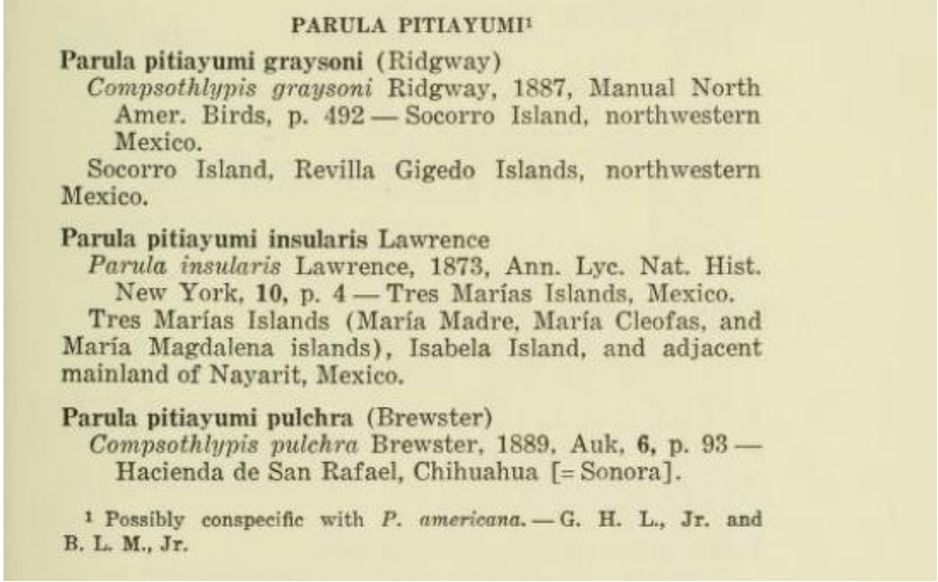
México: Chiapas (common; Ocuilapa, Tuxtla Gutiérrez; possibly intergrades with *P. p. nigrilora* in Veracruz (Buena Vista, May 18).

Parula graysoni (Ridgway).
Socorro Warbler. Verdín de Socorro.

Compsothlypis graysoni Ridgway, Man. N. Am. Birds, 1887, 492 (Socorro Island, off coast of northwestern Mexico; type in U. S. Nat. Mus.).

México: Resident on Socorro Island of Revilla Gigedo group; vagrant in Baja California (Todos Santos, July 23 and November 3; El Oro, February 5).

Then, *graysoni* was treated without comment as a subspecies of *Parula pitiayumi* in Peters' Check-list (Lowery and Monroe 1968, below):



PARULA PITIAYUMI[1]

Parula pitiayumi graysoni (Ridgway)
Compsothlypis graysoni Ridgway, 1887, Manual North Amer. Birds, p. 492 — Socorro Island, northwestern Mexico.
Socorro Island, Revilla Gigedo Islands, northwestern Mexico.

Parula pitiayumi insularis Lawrence
Parula insularis Lawrence, 1873, Ann. Lyc. Nat. Hist. New York, **10**, p. 4 — Tres Marías Islands, Mexico.
Tres Marías Islands (María Madre, María Cleofas, and María Magdalena islands), Isabela Island, and adjacent mainland of Nayarit, Mexico.

Parula pitiayumi pulchra (Brewster)
Compsothlypis pulchra Brewster, 1889, Auk, **6**, p. 93 — Hacienda de San Rafael, Chihuahua [= Sonora].

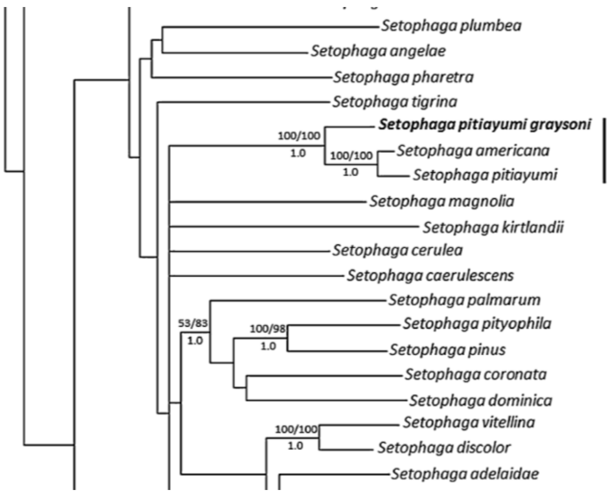
[1] Possibly conspecific with *P. americana*. — G. H. L., Jr. and B. L. M., Jr.

The sixth edition of the *Check-list* (AOU 1983) stated that the "resident population on Socorro Island has sometimes been treated as a distinct species, *P. graysoni*…", without any indication that it had been treated as a species in the previous edition and without any rationale presented for treating it otherwise.

Howell and Webb (1995) noted that the voice of *Parula pitiayumi* in western Mexico (including Socorro) differs from that of northeastern Mexico, and that *graysoni* is "sometimes considered specifically distinct, Socorro Parula." Sibley and Monroe (1993) listed *graysoni* as one of two groups of *Parula pitiayumi*.

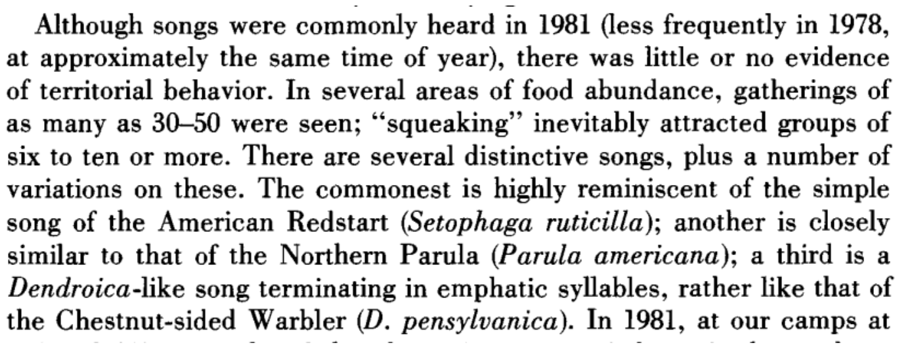
New information:

Evans et al. (2015) used nuclear and mitochondrial sequences from blood samples of four *graysoni*, four nominate *pitiayumi* from Trinidad, and four *americana*. They found that, as with other Socorro endemics *Mimus graysoni*, *Zenaida graysoni*, and *Troglodytes sissonii*, that *Setophaga* [*pitiayumi*] *graysoni* was basal to both *americana* and *pitiayumi*, with strong support (see screenshot of part of Fig. 1 of Evans et al. 2015, below), with sequence divergence of 2.7% from *pitiayumi* and 2.3% from *americana*.



Evans et al. (2015) argued on the basis of their genetic results that *graysoni* should be considered specifically distinct, albeit explicitly under the PSC.

Jehl and Parkes (1982) remarked on the high variability of song in *graysoni*:



> Although songs were commonly heard in 1981 (less frequently in 1978, at approximately the same time of year), there was little or no evidence of territorial behavior. In several areas of food abundance, gatherings of as many as 30–50 were seen; "squeaking" inevitably attracted groups of six to ten or more. There are several distinctive songs, plus a number of variations on these. The commonest is highly reminiscent of the simple song of the American Redstart (*Setophaga ruticilla*); another is closely similar to that of the Northern Parula (*Parula americana*); a third is a *Dendroica*-like song terminating in emphatic syllables, rather like that of the Chestnut-sided Warbler (*D. pensylvanica*). In 1981, at our camps at

Subsequent treatments: del Hoyo and Collar (2016) enacted the split using their scoring system. Part of their rationale was this apparent greater degree of vocal complexity compared with other parulas, although the need for further research was noted. Because the specific treatment of *graysoni* is now an incongruence among global lists, the issue has come up to the WGAC for a vote.

Vocal Differences: In a quick comparison of the few vocalizations that are publicly available, the apparent vocal variability reported by Jehl and Parkes (1982) is not represented in the Socorro birds. However, although the birds of Socorro seem distinct, with a relatively flat, slow trill that does not rise as in Northern Parula or Tropical Parula from northeastern Mexico, they do not seem any more different than other groups of Tropical Parula, with birds of South America and Central America singing very distinct multipart songs, the birds of northeastern Mexico sounding very similar to Northern Parula *Parula americana*, the birds of Tres Marías sounding nothing like any other parula song, and birds of northwestern Mexico sounding almost intermediate between South America, Socorro, and northeastern Mexico.

Although there was not much variation apparent in birds from Socorro in the recordings available, some of the songs given by birds of Tres Marías seem similar to those described by Jehl and Parkes (1982) from Socorro, so it is likely that *graysoni* includes many other song types that have not been recorded. Thus, the vocal differences used as part of the rationale for splitting *graysoni* by del Hoyo and Collar (2016) are not immediately apparent, or at least any more distinct than any of the other groups, although further work is clearly needed to assess vocal variation across the entire range of the Tropical Parula. Given the extensive variation across its range, it is possible that multiple species could be involved. Below is a small selection of songs of some of the different groups from Macaulay Library to give a sense of some of the variation across the range:

Socorro (*graysoni*): https://macaulaylibrary.org/asset/214345, https://macaulaylibrary.org/asset/214337, https://macaulaylibrary.org/asset/214332

Tres Marías (*insularis*): https://macaulaylibrary.org/asset/228785, https://macaulaylibrary.org/asset/228955

West Mexico (*pulchra*): https://macaulaylibrary.org/asset/106125501, https://macaulaylibrary.org/asset/157615801

Northeast Mexico (*nigrilora*): https://macaulaylibrary.org/asset/186780, https://macaulaylibrary.org/asset/186631

Central America (*inornata*): https://macaulaylibrary.org/asset/39271, https://macaulaylibrary.org/asset/32720

South America (nominate *pitiayumi* group): https://macaulaylibrary.org/asset/243688, https://macaulaylibrary.org/asset/298264

Effect on AOU-CLC area:

Acceptance of the split would add a species to the AOS region and an endemic species to Mexico and Isla Socorro. Note that the putative vagrant *graysoni* in southern Baja California (Lamb 1925) were considered to require verification (AOU 1998).

Recommendation:

If the case were as simple as the three-taxon relationship in the tree of Evans et al. (2015), it would be easy to recommend a YES vote to recognize *graysoni* as a full species. However, *pitiayumi* has several subspecies (9 including *graysoni* in most recent global checklists; Dickinson and Christidis 2014, Clements et al. 2021, Gill et al. 2022), of which *graysoni* is much the most distinctive phenotypically, and its voice is evidently highly variable (e.g., Jehl and Parkes 1982). De Silva et al. (2020) noted that although *graysoni* is the most distinct and lacks black around the lores, resembling the juvenile plumage of other subspecies, a small percentage do show some black (Baptista and Martínez-Gómez 2002, in de Silva et al. 2020). In addition to the differences noted in song and plumage for *graysoni*, there are also major differences between the songs of northeastern and western Mexican populations, as noted by Howell and Webb (1995), and there are now numerous online recordings of the Tres Marias taxon *insularis*, which is phenotypically much more like other taxa but has a strikingly distinct song. So is *insularis* also best considered specifically distinct? Subspecies *insularis*, although occurring on the Tres Marías, also occurs on the mainland of Mexico, where it apparently hybridizes with subspecies *pulchra* (Iliff et al. 2008); hybridization may be extensive in some areas (de Silva et al. 2020). And what about the other vocally distinct taxa? A comprehensive integrative taxonomic analysis of the entire complex would be ideal but could be years in the making. Fortunately, by all accounts *graysoni* is still a very common bird and thus the controversial “precautionary principle” does not need to be invoked in this case.

Despite some uncertainty surrounding the taxonomic status of other subspecies of Tropical Parula, we recommend that the committee vote to split *graysoni* from *S. pitiayumi*, returning to the treatment in previous editions of the Check-list (AOU 1931, 1957). Although the taxonomy of *S. pitiayumi* is complicated and requires further study, the paraphyly of *pitiayumi* if *graysoni* is included (Evans et al. 2015), together with the phenotypic distinctiveness of *graysoni*, as recognized in previous treatments of it as a species, support restoring *graysoni* to species status. This would reverse the decision of AOU (1983) to lump the species, which was made without comment. Future work on the parulas may indicate that further splits are warranted; however, that should not affect the status of the island endemic *graysoni* on Socorro.

If the committee does vote to split *Setophaga graysoni*, we recommend adopting the English name Socorro Parula. Some version of this name has been used by numerous authors, including Ridgway (1887), who called the bird Socorro Warbler (see also AOU 1957), and del Hoyo and Collar (2016), who called it Socorro Parula.

Acknowledgments: Thanks to A. Peterson of zoonomen.net for the links to the original descriptions of *graysoni* and *insularis*.

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Submitted by: Pamela C. Rasmussen, Michigan State University, and Shawn M. Billerman, Cornell Lab of Ornithology

Date of proposal: 7 May 2022

Separate Hepatic Tanager *Piranga flava* into as many as five species

Condensed NACC overview:

Below is a proposal that I submitted to SACC, modified slightly for NACC. Much of the text and most of the diversity is not relevant to NACC, but I left it intact because the complexity is indirectly relevant to what we do with taxa in the NACC area.

Briefly, we have two of the three subspecies groups in our area (although the gory details in the SACC proposal suggest there may be at least 5 groups). Our two groups are the "Northern Hepatic-tanager", the *hepatica* group, from the SW USA to Nicaragua, and the *lutea* group from Nicaragua south to South America.

This proposal focuses on the big question as to whether we are ready to split Hepatic Tanager into two or more species Y or N. A Yes vote would split the populations in our area into two species regardless of the complexity in South America.

Full SACC proposal:

Background: This is a well-known problem in species limits that has been dealt with differently by different authors for at least 120 years. Our current note reads as follows:

> Zimmer (1929) was the first to treat all members of the *P. flava* group as a single species, and this has been followed by most subsequent authors, although AOU (1983, 1998) recognized three subspecies groups, and Isler & Isler (1987) suggested that each might be better treated as separate species. Meyer de Schauensee (1966) and Ridgely & Tudor (1989) also proposed that this species probably consists of two or three separate species. Two of these occur in South America: nominate *flava* of southern and eastern South America, and the *lutea* group of the Andes region (and also Panama and Costa Rica). See Zimmer (1929) concerning earlier claims of sympatry between *flava* and *lutea*. Burns (1998) proposed that the three subspecies groups should be treated as three phylogenetic species, and possibly biological species, based on comparative genetic distance data within *Piranga*. Ridgely & Greenfield (2001) and Hilty (2011) treated the three groups as separate species. Haverschmidt and Mees (1994) treated the subspecies *haemalea* of the Tepuis as a separate species from *P. flava* based on habitat differences. Manthey et al. (2016) found that *haemalea* was not part of the *lutea* group. SACC proposal needed.

Ridgway (1902) treated the complex as 2 species, as follows:

1. *Piranga hepatica* (Hepatic Tanager): SW USA to Guatemala
2. *Piranga testacea*: (Brick-red Tanager: Nicaragua to Bolivia (also with pine-lands subspecies "Belize Tanager" *P. t. figlina* from Guatemala to Honduras)

Although many of the Neotropical subspecies were not yet described, *haemalea* of the Tepui region was described in 1883, but was not mentioned by Ridgway, nor was any member of the even older lowland *flava=azarae* group of south-central South America. This might suggest that Ridgway did not consider them part of this group.

Zimmer's (1929) 50-page monograph on the group is the basis of our current classification. However, this monograph was written in an era when vocalizations were not taken into account – all taxonomy was based on external morphology combined with distributional considerations (e.g., sympatry/parapatry vs. allopatry). Here is Zimmer's synopsis, and you can see that similarities between the extreme northern and southern taxa strongly influenced his reasoning for treating them all as conspecific:

> Examination of numerous specimens of these forms and certain of their unquestioned allies has fostered the belief that all are races of a single species whose distribution extends from eastern Argentina to southwestern United States with little interruption in continuity, though with lateral extensions into Brazil and the Guianas and into Venezuela and the Guianas in two lines of development which meet at their outward extremities. Throughout this extensive group, the color, general pattern, size, shape of bill, and other major characters are substantially identical or are subject to variability which largely overcomes the individual differences. There are certain features of plumage and molt which seem to be present in all the forms under consideration but which are different from those of the other congeneric groups. The various forms replace each other geographically in all parts of the range. Finally, at the northern and southern extremities forms are produced which are strikingly alike in racial characters that are not shared by the intervening subspecies.
>
> These considerations together present a volume of evidence that is more than circumstantial. There is no question that all the forms under discussion are of common phylogenetic origin. Some of them are more strongly differentiated than others, some distinctly intergrade with adjacent forms, while others are separated from their nearest allies by so slight a gap in proportion to the individual variation in that direction that the relationship is not seriously impaired. In the following treatment, therefore, I have considered as races of *P. flava* all the forms under discussion.

Zimmer's study was perhaps the most thorough study of a single widespread Neotropical bird of that era. So, this situation is about as different from an unjustified Peters lump as you can get.

Subsequent classifications all followed Zimmer on this, including Hellmayr, Storer in Peters, Sibley & Monroe, AOU, Dickinson & Christidis, etc., except for those mentioned in the SACC note above and the recent HBW/BLI classification.

Isler & Isler (1987) summarized the qualitative differences in songs and calls for the three groups, as well as the rather exceptional range of habitats for a single passerine species (e.g., from arid pinyon-juniper scrub to edges of cloud-forest). The habitat differences were remarked upon and noted as exceptional by Zimmer himself. Ridgely & Tudor (1989) proposed that at least 2 and maybe 3 species were involved.

Here is the breakdown from Isler & Isler (1987), with distribution refinements from Dickinson & Christidis (2014). Because this is a complex proposal, I suspect these details might come in handy

(A) *hepatica* group (extralimital to SACC)

1. nominate *hepatica:* highlands of SE California, Arizona, and w. New Mexico S in western Mexico to Oaxaca
2. *dextra*: highlands of e. New Mexico [presumably this species also in Las Animas Co., CO] and SW Texas south on Caribbean slope to Chiapas
3. *albifacies*: in highlands of w. Guatemala to n. Nicaragua
4. *figlina*: lowland pine savannahs of Belize and e. Guatemala
5. *savannarum*: lowland pine savannahs of extreme e. Honduras and NE Nicaragua

(B) *lutea* group

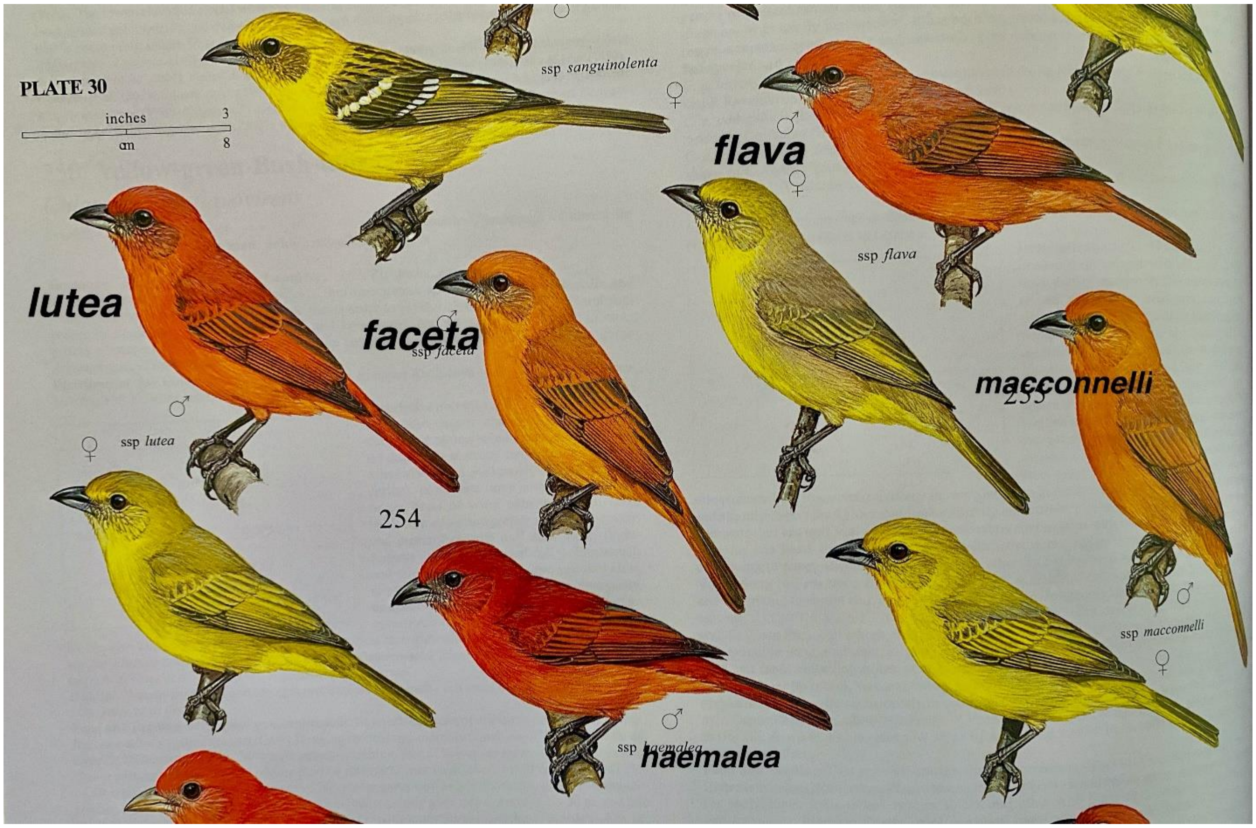
6. *testacea*: highlands of n. Costa Rica to e. Panama (Darién)
7. *faceta*: Santa Marta to highlands of Venezuela; Trinidad
8. *haemalea*: tepui region from c. Venezuela, n. Brazil, c. Guyana, c. Suriname
9. *toddi*: two spots in n. Andes of Colombia
10. *desidiosa*: W. Andes of Colombia (Antioquia to Cauca)
11. nominate *lutea:* Andes from Nariño S through Ecuador and Peru to c. Bolivia (Cochabamba)

(C) *flava* group

12. *macconnelli*: lowlands of n. Brazil (Roraima) and the southern Guianas.
13. *saira*: lowlands of e. Brazil from Amapá south (patchily) to Mato Grosso and Rio Grande do Sul
14. *rosacea*: lowlands of se. Bolivia e. Santa Cruz)
15. nominate *flava*: foothills of E Bolivia from Cochabamba and w. Santa Cruz, S in lowlands to Paraguay, n. Argentina and Uruguay [note that if the Bolivian records pertain to breeding birds, then this is not strictly a lowland taxon; however, because this is an austral migrant, I would not be surprised if these foothill records are wintering birds only – this needs to be sorted out]

The HBW plate by H. Burn that illustrates five of the subspecies is on the next page.

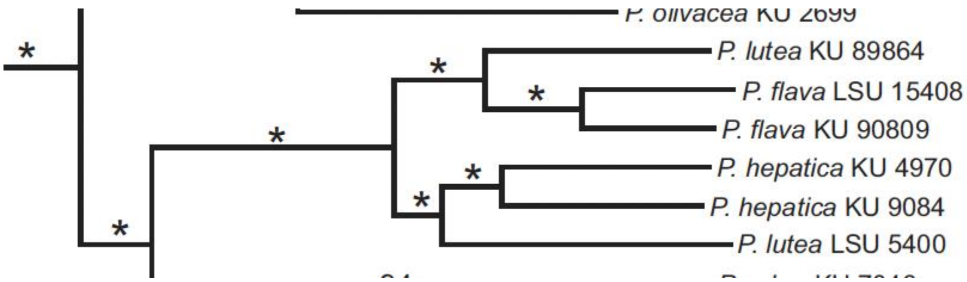
Burns (1998) proposed that the three subspecies group be treated as separate phylogenetic and perhaps biological species based on comparative genetic distance data (cyt-b); however, this was based on just seven specimens, only one from the *lutea* group. Burns concluded: “The DNA data of this study add to the morphological, distributional, and ecological evidence that suggest that the three subspecies groups of *P. flava* represent different phylogenetic, if not biological species.”



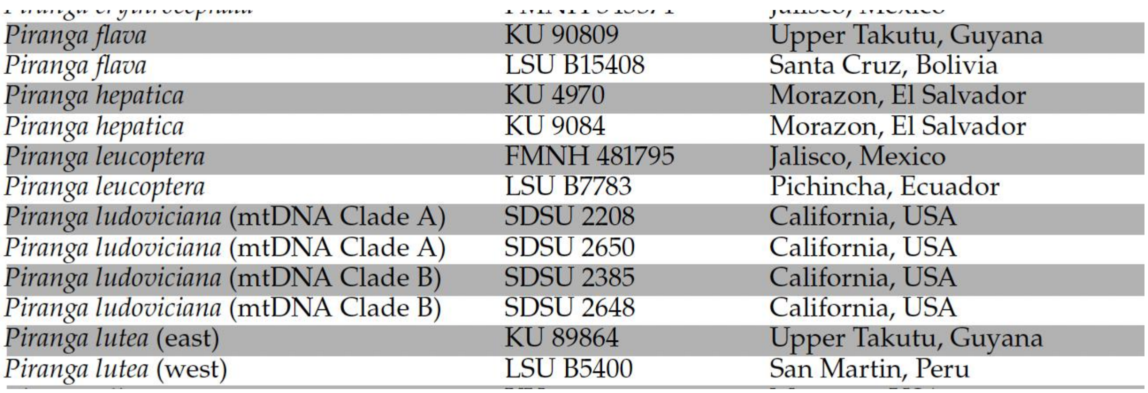
<u>New information (since the original SACC classification)</u>: There really isn't much in the way of new quantitative data.

Ridgely and Greenfield (2001; Ecuador book) cited Burns (1998) for their treatment of Andean *lutea* group as a separate species (Highland Hepatic-Tanager) from lowland *flava* group (Lowland Hepatic-Tanager) as well as the northern *hepatica* group (Northern Hepatic-Tanager), as did Hilty (2003; Birds of Venezuela) and Restall et al. (2006; Birds of Northern South America. Vol. 1); however, note that Burns was rightfully hesitant in calling them biological species.

Manthey et al. (2016) used *Piranga* to compare different genetic techniques (UCEs vs. RAD-seq). They used only 6 individuals of the *flava* complex, two from each subspecies group. Although taxon-sampling was weak, they corroborated what had been concluded by Zimmer nearly a century earlier, i.e. that the three groups formed a monophyletic unit. However, they found that *lutea* was paraphyletic: the Andean sample (N. Peru, ergo nominate *lutea*) was sister to the two samples of *hepatica* (from El Salvador, ergo *albifacies*), but the sample from Guyana (*haemalea*) was sister to the two samples of lowland *flava* (one from Guyana, ergo presumably *macconnelli* and one from e. Bolivia, ergo likely *rosacea*), both with strong support.



A problem here is that both KU samples from Guyana are listed as from the same locality (“Upper Takutu”), which is a lowland savanna locality (*fide* M. Robbins). For a second, I thought I’d found evidence of sympatry of the *lutea* and *flava* groups, and thus automatic species rank for both.



Piranga flava	KU 90809	Upper Takutu, Guyana
Piranga flava	LSU B15408	Santa Cruz, Bolivia
Piranga hepatica	KU 4970	Morazon, El Salvador
Piranga hepatica	KU 9084	Morazon, El Salvador
Piranga leucoptera	FMNH 481795	Jalisco, Mexico
Piranga leucoptera	LSU B7783	Pichincha, Ecuador
Piranga ludoviciana (mtDNA Clade A)	SDSU 2208	California, USA
Piranga ludoviciana (mtDNA Clade A)	SDSU 2650	California, USA
Piranga ludoviciana (mtDNA Clade B)	SDSU 2385	California, USA
Piranga ludoviciana (mtDNA Clade B)	SDSU 2648	California, USA
Piranga lutea (east)	KU 89864	Upper Takutu, Guyana
Piranga lutea (west)	LSU B5400	San Martin, Peru

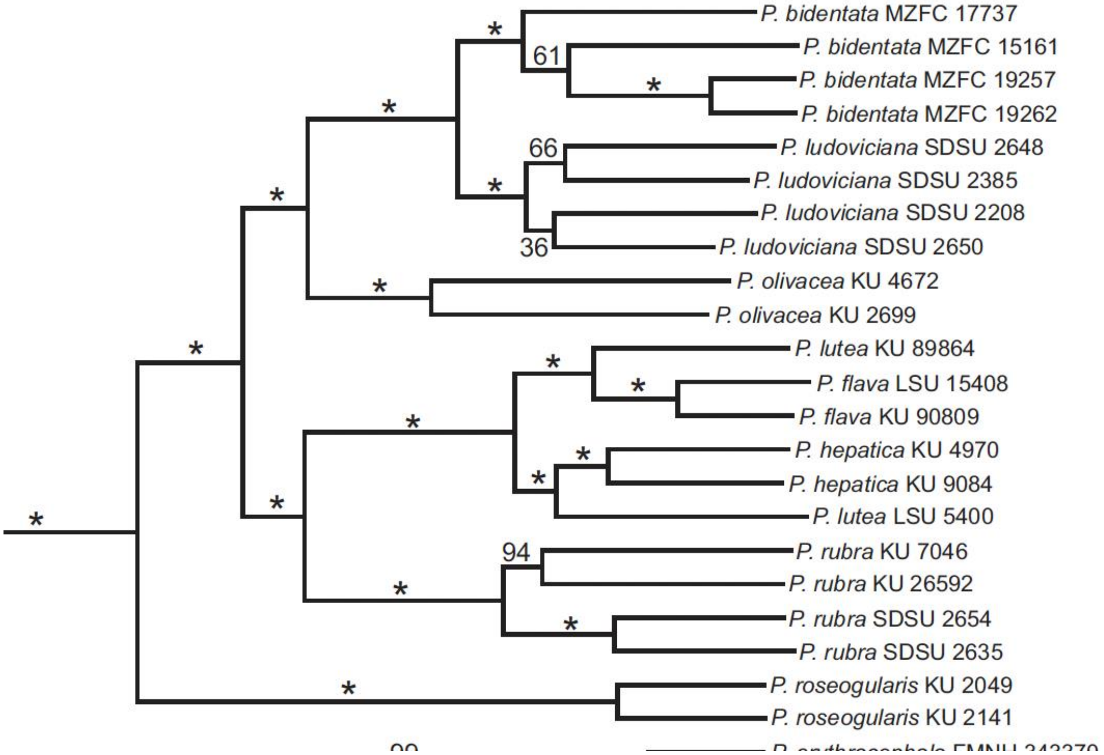
But because Manthey et al. didn’t point that out, I suspected an error in their table. So I checked, and sure enough, SACC’s Mark Robbins, who collected both specimens (and who obviously was not asked to go over the paper), told me that this turns out to be an undetected copy-paste error. From Mark:

> “90809: 1.5 km S of Karaudanawa, in the upper Rupununi, i.e., lowland site; ID as *macconnelli.*
> “89864: Acai Mts, in the extreme south [of Guyana]! ID as *haemalea*”

Nonetheless, it still remains that, as Manthey et al. pointed out, the *lutea* group as currently constructed is not monophyletic. The tepui subspecies *haemalea* groups with the lowland *flava* group even though in plumage and elevation, it fits with the Andean *lutea* group. Therefore, either the *haemalea* group should be transferred to the *flava* group, which would not make sense from plumage, or be treated as its own group. Given that Haverschmidt and Mees (1994) treated *haemalea* as a separate species, and that *haemalea* does not fit with *flava* in plumage or elevation, this should be at least treated as a separate, fourth group in analyses. Finally, that Robbins’ two specimens are only about 150 km from each other, but have such strong genetic and phenotypic differences, the evidence for treating *haemalea* as a separate species from *flava*, much less *lutea*, ironically could be considered stronger than that for any of the other proposed splits even though it’s never been recognized as a separate group.

Time for a mini-rant. The above is yet another vivid demonstration of the importance of broad taxon-sampling. In terms of genetic sampling, one cannot just assume that a group of subspecies are a monophyletic group unless all the taxa are sampled. For all we know, the isolated *lutea* subspecies in the north group with *haemalea* rather than nominate *lutea,* or form their own group, or each forms a separate group, or *testacea* actually groups with *hepatica*, or …. .

With respect to Manthey et al., with such limited taxon-sampling (only 5 of 15 subspecies represented), I find it hard to extract any firm evidence for species rank either way. I personally don't think comparative branch lengths and genetic distance can be used as a metric for species limits, but even so the longest branch between the two clusters of Summer Tanager (*P. rubra*) samples is longer than any between any of the Hepatic Tanager groups despite the enormously greater geographic distances among samples of the latter.



By the way, Manthey et al. is cited as evidence for species rank by HBW/BLI and "IOC".

As for vocalizations, Boesman (2016) presented sonograms of songs and calls for each. The N for song sonograms was 3 for *flava* group , 3 for *lutea* group, and 2 for *flava* group, with location/subspecies not specified. The N for calls was 4 *hepatica*, 3 for *lutea*, and 5 for *flava*, also with location/subspecies not specified except for one for *testacea* in the *lutea* group, which appears to be the most different of all.

Here's what my impressions are from the sonograms. In terms of song, I see more differences within the *hepatica* and *lutea* groups than I do between them. As for *flava*, the notes themselves do seem on average more complex, as noted by Boesman: "Song of *flava* group seems to have the most complex-shaped notes, lacking any simpler-shaped notes. Many notes are complex underslurred, and apparently there is little variation in note shape (few different note shapes), unlike other races." As for call notes, those of *hepatica* and *flava* look very similar to me, but those of *flava* look more complex, as noted by Boesman: "Call of *flava* group is also clearly different, having an upslurred ending, while both other groups are about identical, having a very sharp upturned V-shape."

I suspect Peter Boesman would be the first to tell you that this sort of sampling and qualitative comparisons has its problems. I will also repeat the same mini-rant on taxon-sampling that I did on the genetic data. Boesman's studies of this and many other groups are valuable for pointing out potential issues (note his strange recording of *testacea* mentioned above) and can serve as launching pads for more thorough studies. But until all the taxa are sampled, with sufficient N and careful attention to homology, their use as determinants of species limits is perilous. I think we should be grateful that he has set the table for the more detailed analyses needed to really sort things out. Lots of potential here, but also lots of sampling gaps in terms of subspecies and geography. One problem that could be fixed quickly is that the location and subspecies need to be given for each recording; for example, three lutea songs are represented, each looking fairly different. But "which" *lutea*? They could be from testacea from Costa Rica, nominate *lutea* from Bolivia, or any of the other four subspecies in the group, including even *haemalea* from the tepui region, which we now know is not a member of the group. Or they could all three be from different individuals within any one of the 6 subspecies.

Just to give you an idea what the call notes are like, I grabbed a few links:

- A call note from nominate *hepatica* from AZ (Richard Webster): https://xeno-canto.org/678668
- A call note from *testacea* from Panama (Peter Boesman): https://xeno-canto.org/271527
- a call note from nominate *lutea* from Peru (Fabrice Schmitt): https://xeno-canto.org/102734
- A call note from nominate *flava* from Paraguay (Fabrice Schmitt): https://xeno-canto.org/616311
- A call note from haemalea from Guyana (Ted Parker): https://search.macaulaylibrary.org/catalog?taxonCode=heptan&tag=call&regionCode=GY

What stands out to me from superficial browsing of these and others on xeno-canto is (1) as Boesman (2016) noted about *testacea*, that twittered, crossbill-like call seems to be standard, and if that is the case, then *testacea* has by far the most distinctive call; (2) *hepatica*, *lutea*, and *haemalea* calls sound fairly similar; (3) *flava* calls are higher-pitched and slightly inflected, but in the background of the Paraguay recording, I think I hear another bird giving a lower-pitched call more like northern birds. Obviously, a quantitative analysis of all of this needed, with larger N of presumed homologous calls. My gut impression is that when all the data are analyzed, they will support *testacea* as a separate species.

Piranga songs are fairly complex, and so the final analysis will not be easy. Note that the vocal pattern does not fit the plumage pattern, e.g. *lutea* and *hepatica* are evidently the most similar vocally, whereas *flava* and *hepatica* are most similar plumage-wise (which is at the core of Zimmer's rationale for conspecificity).

<u>Discussion and Recommendation</u>:

This issue is a real problem. On the one hand, I share the instinctive feeling of just about everyone who has commented on the group post-Zimmer that more than one species is involved, but I would bump it up to at least 5 potential species. If this really is to be treated as one biological species, then the breadth of habitat types covered would be exceptional, ranging from arid, rocky, pinyon-juniper slopes in the north to pine savanna to the margins of cloud forest and semi-humid montane forest to tropical dry forest; the only common denominator might be that the structure of the habitat is open woodland and edge. (House Wren and Squirrel Cuckoo are the only species of woodland birds that I can think of offhand that could compete with Hepatic Tanager for habitat breadth.) But it's hard to find conclusive evidence for treating them as separate species. The plumages differ, but not outside the range of variation for many polytypic species. The genetic data are too weak to be interpreted either way, especially with the sampling gaps. The vocal differences, even qualitatively, between the *flava* group vs. the other two suggest multiple separate species, but are the data officially strong enough for a split?

This complex is begging for dissertation-level research. Geographic areas in need of careful sampling are:

(1) the potential contact areas between *haemalea* of the tepuis and *macconnelli* of the lowlands. They come pretty close in Guyana and Suriname but are likely separated by unsuitable habitat: tall tropical forest. If there is no sign of gene flow, then that's all you need to argue for species rank in my opinion even if not precisely parapatric.

(2) central Bolivia, where it is unclear how close *lutea* and breeding *flava* come to each other. The sampling in Herzog et al. (2016) shows a continuous distribution from the Andes of La Paz and Cochabamba through the foothills of Santa Cruz and Chuquisaca to the lowlands of Santa Cruz and Tarija. If these refer to resident populations, then there is a contact zone somewhere in there, as Hellmayr (1929) noted. Specimens from w. Santa Cruz and Chuquisaca are all assigned to *flava* despite their montane distribution. But we also noted that *flava* is a partial austral migrant. A first pass through the dates, elevations, and subspecies identification would likely clear much of this up (but I'm out of time/energy to do that within a SACC proposal). Hellmayr (1929) did not pick up on the possibility of austral migrants messing up the distribution. Follow-up fieldwork in the region might be highly productive. This is the region where lowland subspecies of *Thamnophilus caerulescens* meet Andean subspecies, with connecting populations with intermediate phenotypes and genotypes (Brumfield papers), and where the same thing appears to be happening in other taxa that have similar distributions (e.g., *Pyriglena leuconota*).

The sampling and analysis of songs and calls needs to be done rigorously, with all taxa sampled. The *Piranga* I know, including northern Hepatic, respond vigorously to playback, so careful playback experiments might be illuminating. Eyal Shy's dissertation on North American *Piranga* songs needs to be read for guidance, as well as his several subsequently published papers on geographic variation in song within Summer (*P. rubra*) and Scarlet (*P. olivacea*) tanagers. The complexity of the structure of *Piranga* songs requires quantitative analyses of their differences with a large sample size.

I went into this issue fairly confident that I would find sufficient anecdotal evidence that in aggregate would make a case for elevating two or three of these (or four or five) subspecies to species rank, but was unable to do so. The deeper I went, the more complexity was unveiled. Although I am certain that once all the data are available, we will have evidence for multiple species in the group, I would be extremely reluctant to change current taxonomy without having a firm foundation.

Let's break down the voting on this proposal as follows:

A YES vote means you are in favor of splitting up *Piranga flava* into 2, 3, 4 (or more?) species, with the precise breakdown to be determined in subsequent voting round. Note that any vote on extralimital *hepatica* would be strictly advisory to NACC.

A NO vote means leave as is for now.

I recommend a NO vote. This is a juicy project waiting for a thorough analysis. I'm not opposed to piecemeal taxonomy, but I really can't find any convincing evidence for any of the splits, as outlined in the details. I see no immediate rush to resolve this one using fragmentary, unsatisfactory evidence.

English names: The classifications that recognize 3 species use Northern Hepatic-Tanager, Highland Hepatic-Tanager, and Lowland Hepatic-Tanager for the three groups. They have had traction in the literature since Isler and Isler (1987). But they strike me as particularly ugly, for some reason. If this proposal passes, then I recommend a separate proposal on English names, which would also give us time for other choices to emerge. For example, I would consider retaining Hepatic Tanager for the northern group, contrary to our usual policy for parent-daughter splits, and using Tooth-billed and Red for the other two groups, just because they have historical precedent, albeit inconsistent (and not because they are particularly appropriate).

References (partial):

Boesman, P. 2016. Notes on the vocalizations of Northern Hepatic-tanager (*Piranga hepatica*), Highland Hepatic-tanager (*Piranga lutea*) and Lowland Hepatic-tanager (*Piranga flava*). https://birdsoftheworld.org/bow/ornith-notes/JN100386

Burns, K. J. 1998. Molecular phylogenetics of the genus *Piranga*: implications for biogeography and the evolution of morphology and behavior. Auk 115: 621–634.

Herzog, S. K., Terrill, R. S., Jahn, A. E., Remsen, J. V., Maillard, O. Z., García-Solíz, V. H., MacLeod, R., Maccormick, A., Vidoz, J. Q., Tofte, C. C., Slongo, Hr., Tintaya, Or., Kessler, M., Fjeldså, J. 2016. Birds of Bolivia: field guide. Santa Cruz de la Sierra: Asociación Armonía.

Isler, M., and P. Isler. 1987. The Tanagers, Natural History, Distribution, and Identification. Smithsonian Institution, Washington, D.C.

Manthey, J.D., L. C. Campillo, K. J. Burns, and R. G. Moyle. 2016. Comparison of target-capture and restriction-site associated DNA sequencing for phylogenomics: a test in cardinalid tanagers (Aves, genus: *Piranga*). Systematic Biology 65: 640–650,

Zimmer, J. T. 1929. A study of the Tooth-billed Red Tanager *Piranga flava*. Field Museum Natural History, Zoological Series 17 (5): 169-219.

Submitted by: Van Remsen

Date of Proposal: 22 June 2022

Treat Lesser Antillean Tanager *Stilpnia cucullata* as two species

Background:

The Lesser Antillean Tanager *Stilpnia* (formerly *Tangara*) *cucullata* is found entirely on the islands of Grenada and Saint Vincent in the Lesser Antilles. Most current taxonomies (Clements et al. 2021, Sibley and Monroe 1990, Dickinson & Christidis (2014), Gill et al. 2022) and field guides (e.g., Bond 1999, Raffaele et al. 2003) recognize it as a single species with two subspecies: *T. c. cucullata* from Grenada and *T. c. versicolor* from St. Vincent.

Isler and Isler (1987, 1999) described the two subspecies in this way:

Stilpnia c. cucullata (Swainson, 1834): Male buffy tinged gold on upperparts and violet on underparts; black mask; crown blackish chestnut; wings and tail edged blue green, female: duller, tinged green; crown chestnut.
Stilpnia c. versicolor (Lawrence, 1878): larger and more brightly colored; female: larger but similar to female nominate subspecies.

Lawrence (1878) described *S. c. versicolor* as a new species based on comparing a specimen he received to color plates of Sclater's monograph on "*Tangara*" (Sclater 1857). Lawrence noted the plumage color and pattern differences, and he made note of the large size of the bill. He noted that the bill was larger than that of any "*Tangara*" he was acquainted with as also wrote that it was as large at *Thraupis episcopus*.

As far as I can tell, the HBW-Birdlife list (del Hoyo and Collar 2016) is the only taxonomy that currently treats *versicolor* as a separate species; they provide this reasoning:

> Hitherto treated as conspecific with *T. cucullata,* but differs (in male) in its pale chestnut vs chocolate-brown crown (3); more russet wash to bluish underparts (1); buffier, less greenish tone to hind collar, mantle, back and rump (1); bluer tinge to pale turquoise-green wing fringes and tail fringes (ns1); larger size (effect size for bill 3.02, score 2).

If I am understanding the Tobias et al. (2010) method correctly, most plumage differences are characterized individually as minor, but the crown difference is characterized as "major". The size differences (including the bill) are characterized as "major". Adding them all together leads to the decision to split these. Despite this decision, Birds of the World online (Hilty et al. 2022) continues to treat them as one species, following Clements et al. (2021): "Some recent treatments have elevated each of the two subspecies to full species status (del Hoyo and Collar 2016) based on morphology, but traditional treatment is maintained for the moment."

Here are some photos to compare plumage colors and patterns of males:

St. Vincent (*versicolor*):

https://macaulaylibrary.org/asset/436683071
https://macaulaylibrary.org/asset/362189231
https://macaulaylibrary.org/asset/248127241

Grenada (*cucullata*):
https://macaulaylibrary.org/asset/251965621
https://macaulaylibrary.org/asset/83953661
https://macaulaylibrary.org/asset/82531061

New Information:

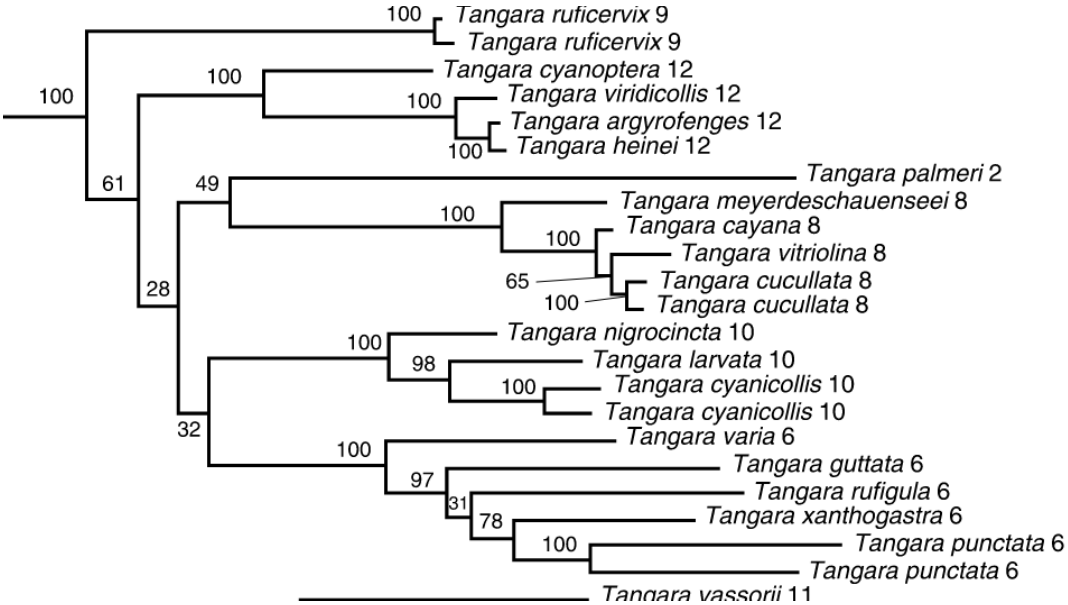
There is no new information *per se*; this proposal is to provide feedback to WGAC which is working to reconcile all world lists. However, below I present some information not previously considered that might be useful.

Morphology

As part of her MS thesis in my lab, Amelia Demery (Demery 2018, Demery et al. 2021) measured multiple individuals of almost all species of tanagers. I looked through her data, and she measured one individual of each subspecies. Lawrence was correct, the bill of *T. c. versicolor* is huge in comparison to other birds in "*Tangara*" and comparable in size to many species of *Thraupis*. When I rank by bill depth, *T. c. versicolor* has the deepest bill of all birds formerly placed in *Tangara*, and it's actually larger than *Thraupis episcopus*, but smaller than some other species of *Thraupis*. In contrast, *S. c. cucullata* is similar in bill size to lots of other species of *Tangara*. I actually measured most tanagers myself in 2012 at the AMNH and also wrote a note to myself at the time about the large size of the bill of *S. c. versicolor*. For what it's worth with an n=1 of each subspecies, here are comparative measures of the two subspecies, *cucullata* vs. *versicolor* (all in mm): Length from nares 8.54 vs 8.83; Length culmen 13.09 vs 12.58; Depth at the nares 6.08 vs 7.57; Depth at the base 6.71 vs 8.40; Width at the nares 6.72 vs 7.08; Width at the base 8.84 vs 9.09; Tarsus 21.87 vs 20.85; Length primary 72.88 vs 75.21; Length Tail 59.47 vs 58.75.

Genetics and Phylogenetics

Burns and Naoki (2004) included one sample of each subspecies in their phylogenetic analyses of the species included in the genus *Tangara* at the time. The study sequenced cyt *b* and ND2 and found the two subspecies were monophyletic, with *Tangara vitriolina* as their closest relative (see example tree below). There was strong support for monophyly of the two subspecies, but not for their position with respect to *T. vitriolina* and *T. cayana*. Subsequent phylogenetic analyses of tanagers (Sedano and Burns 2010, Burns et al. 2014) used only one terminal for *T. cucullata*, using an ND2 sequence from Grenada and the cyt b sequence from St. Vincent. These analyses suggested a closer relationship between *T. cucullata* and *T. cayana*, rather than with *T. vitriolina*. We have an unpublished UCE tree for tanagers that shows 100% support for a closer relationship between *T. cayana* and *T. cucullata*, with *T. vitriolina* as sister species to the clade containing these two species. For the UCE tree, we unfortunately have only one sample of *S. cucullata* and it is from Grenada (*S. c. cucullata*).



From the phylogenetic trees, we can infer that *S. cucullata* represents a single colonization of the Lesser Antilles from the mainland, and branch lengths connecting the two subspecies and the three most closely related species are short. The short branch lengths are reflected in the low levels of sequence divergence observed among these species. Sequence divergence between *S. c. cucullata* and *S. c. versicolor* is 0.8%, similar to what we found among samples of *S. cucullata*, *S. cayana*, and *S. vitriolina*. In particular, levels of sequence divergence between the two subspecies of *S. cucullata* is greater than that seen between *S. cayana* and *S. vitriolina* (*S. cayana* vs. *S. vitriolina* = 0.6%; *S. vitriolina* vs. *S. cucullata* = 1%; *S. cayana* vs. *S. cucullata* = 1.3%). These levels of sequence divergence are less than that seen among most other closely related species of "*Tangara*". However, they are similar to what we observed between *T. argyrofenges* and *T. heinei*. Of course, this is all mtDNA data. However, the branch lengths we see in the UCE tree look similar to those on the mtDNA trees, implying low levels of nuclear variation among these species as well.

Ricklefs and Bermingham (2001) sequenced ATPase 6 & 8 (also mtDNA); they had two samples from each island. However, there is no specific discussion of these sequences in the paper itself or trees presented, and links to the supplemental material are dead. The sequences are on GenBank; thus, I could download these and try to see levels of divergence, etc. The paper estimates timing of colonization between island and mainland taxa. However, the specific date for *S. cucullata* is not given in the paper. I'm also not sure what outgroup they used to determine the timing because I couldn't find ATPase sequences of either *S. cayana* or *S. vitriolina* on GenBank. I could do some more digging if the committee felt it worthwhile.

Vocalizations

I did not find any descriptions comparing vocalizations between subspecies. There are 10 recordings total from all locations on Macaulay library. I listened to these and compared spectrograms but didn't notice any consistent difference. I should note, however, I am personally unable to hear some of the higher pitched notes.

Recommendation:

I've gone back and forth on this proposal. This is the common case of allopatric taxa showing phenotypic and genetic differences; however, without a contact zone, it's difficult to test the biological species concept as we define it. On the one hand, we don't have any support for or against a split based on vocalizations, and we know vocalizations are important in reproductive isolation in songbirds. On the other hand, we have genetic and plumage pattern color differences between these two subspecies that are similar in magnitude as that observed among their closest relatives that are defined as species. Furthermore, the bill depth difference in *S. c. vitriolina* to its relatives is surprisingly large. With the evidence we have at hand, I suppose I will recommend a NO vote to splitting, but I could easily be convinced to vote YES. I would be great to have morphological and plumage color data from a series of specimens, and genetic data from multiple individuals on each island.

English names:

If we do decide to split them, the common names currently used are St. Vincent Tanager and Grenada Tanager, which make sense.

Literature cited:

Bond, James. 1999. A field guide to the birds of the West Indies, 18th edition. Houghton Mifflin Harcourt.

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Del Hoyo, J., and N. J. Collar (2016). HBW and BirdLife International Illustrated Checklist of the Birds of the World. Volume 2. Lynx Edicions, Barcelona, Spain.

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Submitted by: Kevin J. Burns

Date of Proposal: 24 June 2022

Treat Flame-rumped Tanager *Ramphocelus flammigerus* as two species

Background:

The Flame-rumped Tanager (*Ramphocelus flammigerus*) occurs from Panama south through Colombia to southwestern Ecuador and adjacent northwestern Peru. It consists of two subspecies: *R. f. flammigerus* in the northern part of the range and *R. f. icteronotus* in the southern part of the range. They meet and hybridize above 800 meters in the western Andes of Colombia. Both males and females of each subspecies have very different plumage. Males of both subspecies are mostly black, but *R. f. flammigerus* has a bright red back and rump, whereas *R. f. icteronotus* has a yellow back and rump. Females of *R. f. flammigerus* also have a reddish orange band across their chest and reddish-orange rump, undertail coverts, and uppertail coverts, whereas females of *R. f. icteronotus* are solid yellow below and on their rumps

Taxonomic lists and regional field guides differ in how they treat these two taxa. The two forms are treated as subspecies of the same species by Storer (1970), Ridgley and Tudor (1989), Sibley and Monroe (1990), Dickinson (2003), Hilty (2021), and Clements et al. (2021). They are treated as separate species by Meyer de Schauensee (1970), Hilty and Brown (1986), Ridgely & Greenfield (2001), Restall et al. (2007), del Hoyo and Collar (2016), and Gill et al. (2022).

The HBW-Birdlife list (del Hoyo and Collar 2016) provides the following rationale for treating them separate: Usually treated as conspecific with *R. flammigerus*, and genetic differences apparently minimal; moreover, owing to recent deforestation the two taxa now reportedly meet and interbreed in W Andes of Colombia (along a narrow but stable band at middle elevations on upper Pacific slope); even so, visual divergence striking.

New information:

There is no new information *per se*; this proposal is to provide feedback to WGAC which is working to reconcile all world lists. However, there is relatively new research in the hybrid zone that doesn't appear to be considered previously in decisions to classify these taxa as one species or two.

A hybrid zone between the two taxa in western Colombia has been known for many years (Chapman 1917). The zone was studied in some detail by Sibley in the 1950’s (Sibley 1958). More recently, Morales-Rozo et al. (2017) studied the genetics, plumage color, and morphology of birds across the hybrid zone. The hybrid zone occurs in the Cauca River Valley where the lower elevation *R. f. icteronotus* meets the higher elevation *R. f. flammigerus* around 800 meters. The hybrid zone occurs along a 140 km transect and the birds in this area show a gradient from bright yellow to bright red (see Fig. 1, copied from the paper and inserted below). Morales-Rozo et al. (2017) also mentioned that the two forms meet and hybridize in additional contact zones further north in the Cordillera Occidental; however, these areas where not studied at the time of publication. Morales-Rozo et al. (2017) looked at historical specimens and collected fresh specimens in 2007-2010. They sequenced cyt *b* from recent samples as well as from toe pads of the specimens collected by Sibley. Their genetic analyses included samples within the hybrid zone as well as samples far from the hybrid zone in Ecuador and Panama. They also included 6 morphological characters and measured rump plumage coloration using a spectrophotometer. These phenotypic characters were defined into three time periods to study the temporal dynamics of the cline (prior to 1911, 1956-1986, and 2007-2010).

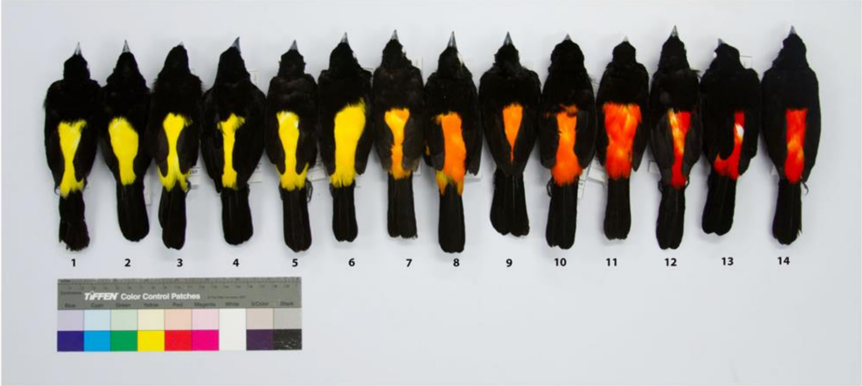

Fig. 1 Phenotypic variation in male specimens collected along the *Ramphocelus flammigerus* hybrid zone in southwestern Colombia. Individuals 1-6 correspond to *R. flammigerus icteronotus* (yellow-rumped form) from the plains of the Pacific coast (sector 1; see Fig. 2). On the other extreme, individuals 11-14 correspond to *R. flammigerus flammigerus* (scarlet-rumped form) distributed towards the Cauca River Valley (sector 3). Individuals 7-10 are intermediates collected near the center of the hybrid zone (sector 2)

Morales-Rozo et al. (2017) found overall low levels of sequence divergence. Within Colombia, samples differed on average by only 0.3%, and samples between Colombia and Panama differed by only 0.4%, but between Colombia and Ecuador, samples differed by 1.6%. Samples from Ecuador and Colombia could be separated in their tree, but otherwise no clades were associated with specific geographic regions or plumage colors. In many cases, individuals with different rump colors and from different geographic regions had the exact same sequence. In addition, no genetic structure was detected across the transect. As the authors stated: “In contrast to multiple studies on hybridization in birds finding significant mtDNA divergence between populations located away from the center of hybrid zones and clinal variation in haplotype frequencies across them, mtDNA variation was not geographically structured in our study system, a likely consequence of recent divergence of the hybridizing populations or of high levels of introgression.” In addition, the authors have niche modeling and demographic data indicating that the two taxa have expanded their range and come into contact after prior isolation. Although the hybrid zone is often thought to be the result of recent anthropogenic activity (deforestation and conversion to crops creating scrub and second growth), the authors’ analyses show it to be much older than expected – around 6,000 years before present. However, anthropogenic activity could still have increased the degree of hybridization.

In contrast to the lack of pattern with the genetic data (due to overall low variation), the authors did find clines for the morphological data and for the plumage color data. For each period of time, the clines for these two character sets where coincident, and the clines appear to have moved slightly to the east and upwards in elevation. In addition, the cline is much narrower than expected under a model of neutral diffusion. Thus, the authors propose that the hybrid zone is a tension zone, where dispersal of parental forms and selection against hybrids balance each other out.

I attended a talk at this year’s Puerto Rico AOS/Birds Caribbean meeting on the same hybrid zone (authors = Castaño, Cadena, and Uy), studied this time using genome-wide SNP data. The results were similar to the mtDNA study in that there was low genetic variation; however, in the new study, they were able to construct a genetic cline with the finer-scale SNP data. From the abstract: “We found low genetic divergence and genetic structure across the hybrid zone, and a discordance in the width and cline center between the genome-wide loci and the plumage clines previously reported. Our results suggest that there are few intermediate individuals (F1 hybrids) and pure and backcrossed individuals of the icteronotus subspecies appear to be distributed across allopatric and sympatric populations.” So it’s pretty consistent with the mtDNA study. The low variation is mostly attributed to recent origin. The lack of F1s is probably due to the fact the pure parentals are not coming into contact. There is ongoing gene flow, but the authors argue that there is some selection against hybrids. The authors also plan to study the other areas of contact mention in the Morales-Rozo et al. (2017) study.

Recommendation:

These two taxa would clearly be recognized as separate species under many other species concepts, like the phylogenetic species concept, that recognizes past evolution of characters as defining evolutionary units. In this case, the plumage differences in both males and females are pretty dramatic and indicate evolution of characters in allopatry. However, this committee follows the biological species concept, which downplays the importance of these events in the face of gene flow, or in the case of allopatric taxa, potentially significant gene flow. The published genetic study based on mtDNA does indicate movement of genes across the hybrid zone and the unpublished nuclear data seems to find a similar pattern. The authors characterize the hybrid zone as a tension zone, thus there is some selection against hybrids. However, there appears to be enough gene flow for this committee to consider them one biological species. Thus, following this concept, I recommend a NO vote on this proposal to split these two taxa. The situation is analogous to the relatively recent lumping by this committee of *R. passerinii* and *R. costaricensis*. These two taxa also differ in the plumage in a similar way as the taxa under consideration in this proposal.

English names:

If we were to vote to split, the English names that are in common use are Lemon-rumped for *R. icteronotus* and Flame-rumped for *R. flammigerus sensu stricto*.

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Submitted by: Kevin J. Burns

Date of Proposal: 24 June 2022, revised 28 June 2022

Treat Scarlet-rumped Cacique *Cacicus uropygialis* as two or three species

Effect on NACC classification:

This would split our *Cacicus uropygialis* (Scarlet-rumped Cacique) into two or three species (one extralimital).

Background:

The three taxa involved are:

- *microrhynchus*: lowlands Honduras to e. Panama
- *pacificus*: lowlands e. Panama south through w. Colombia to w. Ecuador
- *uropygialis*: Western Andes and Central Andes of Colombia; eastern slope of Andes from NW Venezuela south patchily, it seems, through Colombia and Ecuador to s. Peru. (i.e., extralimital to NACC)

The key point to note immediately is that the first two are lowland taxa, whereas extralimital *uropygialis* is strictly montane, and more importantly, that *pacificus* and *uropygialis* both occur in w. Colombia; although evidently not precisely parapatric, they come close, e.g., as per Hilty & Brown (1986), *pacificus* to 1000 m, and *uropygialis* 1500 m and above (but once to 1000 m).

All three are *very* similar in plumage, being basically black caciques with red lower backs and rumps, that differ mainly in slight differences in bill size and shape. Peter Burke's plate from Jaramillo & Burke (1999) is on the next page.

Also marked on the plate are the two subspecies of extralimital *Cacicus haemorrhous* (Red-rumped Cacique), a lowland species of Amazonia and SE Brazil that is not the sister species to this group.

This is a well-known problem in species limits that has been dealt with differently by different authors for at least 120 years. The SACC note reads as follows:

> *Cacicus uropygialis* likely includes two, perhaps three, species-level taxa (Hilty & Brown 1986, Ridgely & Tudor 1989); trans-Andean *microrhynchus* was treated as a separate species by Jaramillo & Burke (1999), Ridgely & Greenfield (2001), and Hilty (2003); Meyer de Schauensee (1966) suspected that the subspecies *pacificus* of western Colombia, included by Jaramillo and Burke (1999) and others as a subspecies of extralimital *C.* (*u.*) *microrhynchus*, might also deserve species rank. Ridgway (1902) evidently treated *microrhynchus* as a separate species from *uropygialis* by omitting mention of the latter. Hellmayr (1938), followed by Wetmore et al. (1984), maintained all as conspecific because of the seemingly intermediate characters of *pacificus*. SACC proposal to recognize *microrhynchus* as separate species did not pass because of


C. h. haemorrhous
14b
14a
14c
C. h. pachyrhynchus
14e
14d
14f
uropygialis
6a
microrhynchus
6b
15a
15b
pacificus
5c
15d

> absence of formal published analysis. Powell et al. (2014) found that *pacificus* was actually sister to *uropygialis*, not *microrhynchus.* SACC proposal needed.

A SACC proposal is now pending – a slightly modified version of the NACC version.

Ridgway (1902) implicitly treated *microrhynchus* as a separate species by not mentioning extralimital *uropygialis* or of course then-undescribed *pacificus*.

Hellmayr (1938) treated all three as conspecific with the following rationale:

> This form [*pacificus*] combines the general dimensions of *C. u. microrhynchus* with the powerful bill of *C. u. uropygialis*, thus occupying in its characters an intermediate position as it does geographically.

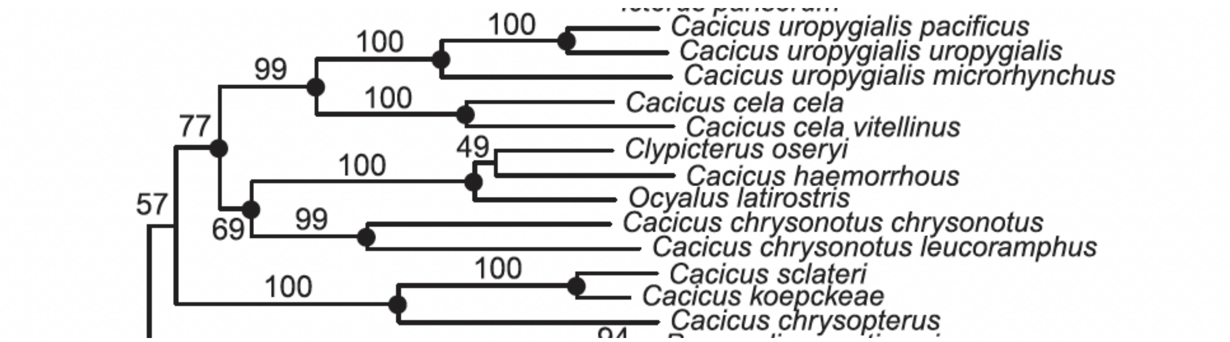
Wetmore (1984) followed Hellmayr and also noted "An occasional adult male of this race [*microrhynchus*] shows a faint swelling on the outer face of the base of the mandibular rami, an indication of approach to the condition found in *C. u. pacificus*, but this is not usual. The 2 races are similar in size." There is no mention of intergradation. Also: "From the somewhat scanty data, there may be a gap between the range of this form [*pacificus*] and that of *C. u. microrhynchus*." And: "The vocalizations of this race include a whistled teeo or keeo, without the burry quality of the corresponding call of *microrhynchus* in the Canal Zone (Eisenmann, in litt.)."

Hilty & Brown (1986) proposed that *pacificus* might be a separate species from *uropygialis* but noted that strict sympatry was not yet known. Ridgely & Tudor (1989) were sure that the lowland taxa (*pacificus* + extralimital *microrhynchus*) would be shown to be separate species based on morphological, vocal, and elevational differences; they suggested Subtropical Cacique for *uropygialis* and retaining Scarlet-rumped for the lowland taxa. Jaramillo & Burke (1999) implemented that split, and their qualitative descriptions of voices are fairly different. Ridgely & Greenfield 2001 (& Robbins and Coopmans 2001) also followed the 2-way split.

In 2003, Jaramillo submitted a SACC proposal to split *microrhynchus* (including *pacificus*) from *uropygialis*, which was rejected. To summarize the outcome of that proposal. most of the committee thought that two species were involved but did not think the split was adequately supported by published data. Alvaro summarized in detail what was known anecdotally in 2003 concerning differences in voices and jizz – see SACC 73 for all that, which I strongly recommend reading.

Fraga (HBW 2011) followed the 2-way split.

Powell et al. (2014), using DNA sequence data, produced the following phylogenetic hypothesis for *Cacicus:*



Note the result that I think would surprise most: *pacificus* and *uropygialis* are actually sisters, not *microrhynchus* and *pacificus*. Powell et al. (2014) remarked: “Some authorities (e.g. Jaramillo and Burke, 1999; Fraga, 2011; Gill and Donsker, 2012) recognize *Cacicus* (*uropygialis*) *microrhynchus* as a species and treat *C. u. pacificus* as a subspecies of *C. microrhynchus*, but mitochondrial DNA indicates that *pacificus* is more closely related to *C. u. uropygialis*.” At face value (as well as eye-balling comparative branch lengths in the broader phylogeny), this would support species rank for all three, in my opinion, given the pronounced vocal differences and near-parapatric distributions of *uropygialis* and *pacificus*. The result, however, should be treated with caution because it might be a case of incomplete lineage-sorting. Also, given the surprise, perhaps the results should double-checked --- I wonder if there was a mistake in branch labelling or sample mix-up. On the other hand, the three taxa are so similar that perhaps we should not be surprised that the genetic relationships don’t match our non-genetic assessment. Up until Powell et al. (2014), no one had considered the possibility that the two lowland, parapatric taxa were not sisters.

Boesman (2016) presented sonograms of *microrhynchus* and *pacificus* (*uropygialis* not considered) and stated:

> Vocal difference between the two races is quite obvious in all homologous vocalizations:
> * single notes: nominate utters irregularly overslurred notes reaching max. frequency of 3.2 - 4kHz, *pacificus* principally downslurred notes reaching max. frequency of 2.2 - 2.6kHz.
> * fast rattling series: A similar difference in max. frequency and nominate often combines two series of different repeated notes.

He presented sonograms of 7 *pacificus* and 11 *microrhynchus* (1 Honduras, 5 Costa Rica, 5 Panama). The sonograms look different, but there is a lot of variation within each, as might be expected from the considerable repertoire of most *Cacicus*. Boesman noted the absence of recordings from eastern Panama and Colombia from near the putative area of contact, but clearly considered the evidence presented as worthy of species rank.

I played around with sample recordings of all three on xeno-canto. With the remarkable variability in vocalizations, it was quickly obvious that casual browsing wouldn’t produce anything but trouble. Those with more patience of course may pull some signal out of all those noises. I will say that *uropygialis* “sounds different” from the other two, with the notes having a different, querulous quality that somehow reminds me of (don’t laugh) *Crotophaga ani.* I can certainly see why the genetic results of Powell et al. (2014) should surprise people.

Discussion and Recommendation:

I hesitate to make taxonomic changes without solid, published data, but in this case I lean towards a 3-way split for the following reasons. First, in contrast to the previous proposal on *Piranga rubra*, the original lump of the three was based on a 1938-genre qualitative assessment of size and bill characters that suggested that *pacificus* was intermediate, and thus is a "bridge" between *microrhynchus* and *uropygialis*. This would be insufficient evidence by recent standards. Second, the plumage differences among taxa that are for-sure species in *Cacicus* are not very large; for example, see the illustration above, in which it is difficult to ascertain differences between *C. haemorrhous* and the group covered in this proposal, despite them not being at all closely related within the genus. Third, with all appropriate caveats, the voices of the three are evidently different, especially *uropygialis* vs. the other two, yet genetic data suggest that *uropygialis* and *pacificus* are sisters

Fourth, and most important to me, is biogeography. Although perhaps so similar that intergrades would not be detected, *microrhynchus* and *pacificus* are nearly parapatric without any signs of gene flow. Although there is no physical barrier between the two, range boundaries that end or begin in Darién, Panama, are numerous --- perhaps one of the most prevalent distribution patterns in Central America. Going way out on a limb …. This implies to me that ecological conditions change fairly abruptly in that region, perhaps caused by differences in rainfall. If that's the case, then perhaps the *microrhynchus* and *pacificus* genomes are incompatible to the extent that interbreeding is prevented or limited. More impressive to me is the near-parapatry of *pacificus* and *uropygialis* in western Colombia. Again, there is no physical barrier between the two – the two populations are likely within sight of each other. Yet there is no sign of gene flow. What that tells me is that these two populations have diverged to the point that they have adapted to different ecological conditions, and neither has conquered the conditions in the minor elevational gap (if there really is one). In contrast, if they were the same species, then I would expect free gene flow and a continuous distribution of the two taxa if they were two species, with a zone of intergradation at intermediate elevations. Parapatry without gene flow is prima facie evidence for species rank.

I need to invent a term for the distribution pattern in which two taxa may not be in direct physical contact but rather are separated only by habitat that is evidently unsuitable to either population. For reasons outlined above, I consider this as evidence for species rank. If the two populations were separated by a physical barrier, then I would label them as allopatric, regardless of the width of the barrier, because it appears to be physical limits to dispersal ability, i.e. extrinsic factors, that are keeping two populations from contact, in contrast to the intrinsic factors that keep these two pairs of taxa apart. (By the way, I am working on a short paper on this as an operational criterion for species rank, so feedback welcomed. I'm also groping for a term to describe this near-parapatry situation that doesn't imply a distance criterion, so if anyone has suggestions, fire away. The best I can come up with are unsatisfying: "quasi-parapatry" and "effective parapatry."

There are actually four possible taxonomic treatments of the complex:

A. No change, i.e. one polytypic species.
B. Two species: (1) *uropygialis* and (2) *microrhynchus* + *pacificus* (as in many recent classifications)
C. Two species: (1) *uropygialis* + *pacificus* based on the relationships in Powell et al., and (2) *microrhynchus*
D. Three species: (1) *uropygialis*, (2) *microrhynchus*, (3) *pacificus*

So, for voting purposes, a YES means 3 species, i.e., option D, and a NO means one of the other options, which will then be voted on in a subsequent proposal if D (three species, the title of the proposal) is rejected.

English names:

I favor a separate proposal on English names if this one passes. The simplest solution would be to go with the flow as in recent literature and use Pacific Cacique for *pacificus*, Subtropical Cacique for *uropygialis*, and retain Scarlet-rumped Cacique for *microrhynchus* s.s. Those names don't have too much traction, however, so reasons for a second look are as follows. Many, including me, don't like using "Pacific" for non-marine or non-insular species. There is precedent for it, yes, but that doesn't mean it's good. Second, retaining Scarlet-rumped for *microrhynchus* bumps up against our guidelines for English names in parent-daughter splits, and all three have identical scarlet rumps, so the name is not useful and causes perpetual confusion because it has been applied to THREE separate taxonomic concepts: broadly defined *uropygialis*, *microrhynchus* + *pacificus*, and just *microrhynchus*. On the other hand, Scarlet-rumped works well within the context of Central America, and although its range is small, certainly it is the most frequently seen and studied scarlet-rumped cacique because of its presence in heavily visited Costa Rica and Panama. Ridgway (1902), by the way, used Small-billed Cacique for *microrhynchus*, and that indeed is one of the only differences between it and *pacificus*. Also, some might favor a hyphenated group-name approach, e.g. Subtropical Scarlet-rumped, etc.

Submitted by: Van Remsen

Date of Proposal: 25 June 2022

Treat *Sporophila ophthalmica* as a separate species from Variable Seedeater *S. corvina*

Effect on NACC and SACC:

This would recognize the Panamanian and NW South American *Sporophila ophthalmica* (including subspecies *S. o. hoffmanni*, *S. o. hicksii*, and *S. o. ophthalmica*) as a species distinct from the Middle American *S. corvina* (Variable Seedeater).

Background:

We are revisiting this species limits issue in association with the effort to harmonize world lists, and our treating *S. corvina* as a single species that includes *S. ophthalmica* as a major subspecific group is a point of disagreement. HBW-BL recognizes the latter as a biological species; we do not.

The taxonomic history of this complex has been one of considerable turmoil. Plumage variation in adult males is considerable, and this has misguided past efforts to understand species limits in the group. Our current name of Variable Seedeater for *S. corvina* sensu lato says it well.

Briefly, NACC split *S. corvina* from *S. americana* following 2014-A-3 (Jim Rising, 2013), which stemmed from SACC Proposal #287 (F. Gary Stiles, 2007), which was based on Stiles (1996). (This followed NACC merging the *corvina* and *aurita* groups with *americana* in 1997; Supplement 41. The subsequent *corvina-americana* split had been proposed in 2002 but did not pass (Banks et al. 2002).).

Current NACC treatment is as follows (Chesser et al. 2014):

> **Notes**.—Groups: *S. corvina* (Sclater, 1860) [Black Seedeater] and *S. ophthalmica* (Sclater, 1860) [Variable Seedeater]. Formerly considered conspecific with South American *Sporophila americana* (Gmelin 1789) [Wing-barred Seedeater], but treated as a separate species on the basis of similarities in plumage pattern, plumage sequences, distribution, and biometrics, and two localized zones of at least sporadic hybridization between *S. corvina* and extralimital *Sporophila intermedia* Cabanis, 1851 [Gray Seedeater], which on this basis are considered to be sister species (Stiles 1996). As noted by Olson (1981b) and Stiles (1996), *Sporophila* ‘‘*aurita*’’ Bonaparte 1850 represents intergrades between *S. c. corvina* and *S. c. hicksii* Lawrence 1865. The type has disappeared, and it is impossible to assign this name to either of the parental populations.

Note that the hybrid swarm where these two taxonomic groups come into contact is so pronounced that it seems that the resulting population received its own taxonomic name, “*aurita*” (Olson 1981). As Olson (1981:388) found, “No specimens of pure parental stock occur in the area of intergradation…” That indicates a lot of gene flow and likely no cost in hybrids’ relative fitness.

New Information

HBW (del Hoyo and Collar 2016) split these taxa giving the following account under *S. ophthalmica*:

> Hitherto treated as conspecific with *S. corvina* (and formerly with *S. americana*) under the name "Variable Seedeater", but separated here on account of its black-and-white vs all-black plumage in male (4); notably paler overall ochre-brown plumage in female, with paler area on central belly (1); reportedly more musical song, "*aurita*" being described as "a much better, sweeter singer than the Caribbean *corvina*" (1) (allow 2); narrow hybrid zone near Canal Zone of Panama involving race *hicksii*, resulting in hybrids to which the name "*aurita*" applies (2); and possible habitat difference, frequenting "dense thickety stands along the edge of woodland" vs "largely in the open and semi-open" (1) (ns).

Ocampo et al. (2022) found reduced geneflow between *corvina* and *ophthalmica* groups in the area where their distributions meet. However, they found poor phylogenetic signal and higher genetic similarity between *S. c. corvina* and *S. c. hicksii/S. c. hoffmanni* in mitochondrial (ND2) and nuclear markers (genome-wide SNPs), than, for instance, between individuals of *S. c. ophthalmica* and *S. c. hicksii/S. c. hoffmanni*.

> We found noticeable mitochondrial structure and low haplotype sharing between subspecies (Fig. 2). However, our three phylogenetic analyses differed in the topologies among the *S. c. hoffmanni*, *S. c. hicksii,* and *S. c. corvina.* This pattern of more subtle genetic structure and low phylogenetic signal suggests a recent radiation of the group with high levels of incomplete lineage sorting and gene flow. Despite the inconsistencies among our phylogenetic reconstructions, we found that the three pied subspecies do not form a monophyletic group as was previously hypothesized by Stiles (1996). Instead, the entirely black *S. c. corvina* subspecies was always embedded within the pied subspecies (Fig. 2, Fig. 3), suggesting that *S. c. corvina* diverged from pied ancestors.

Moreover, unpublished data focusing on the geographic region of the hybrid swarm shows individuals of admixed ancestry between *S. c. hoffmanni*, *S. c. hicksii,* and *S. c. corvina* clades (Ocampo et al, *in prep.*; Figure 1). It also uses genomic evidence to confirm Olson's (1981) observation, that no parental individuals occur at the hybrid zone. That is, the hybrid swarm is composed of later-generation hybrids and back-crosses with overall low heterozygosity, and no first-generation hybrids occur due to the direct interaction between parental populations (Figure 2). While we recognize that the NACC and SACC committees do not make decisions based on unpublished evidence, we include this pending evidence to show that we can see around the proverbial corner on this issue, and it is not going to support splitting these taxa as biological species.

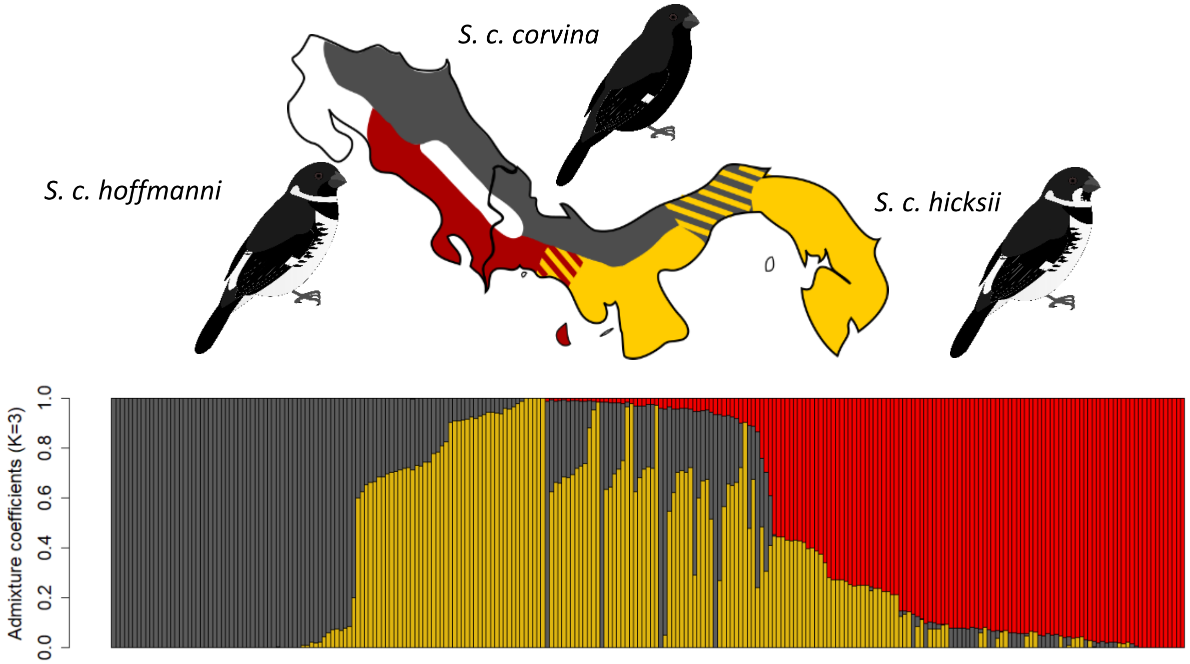


Figure 1. Subspecies distribution and admixture proportion per individual, based on the best result from ADMIXURE (*k* = 3).

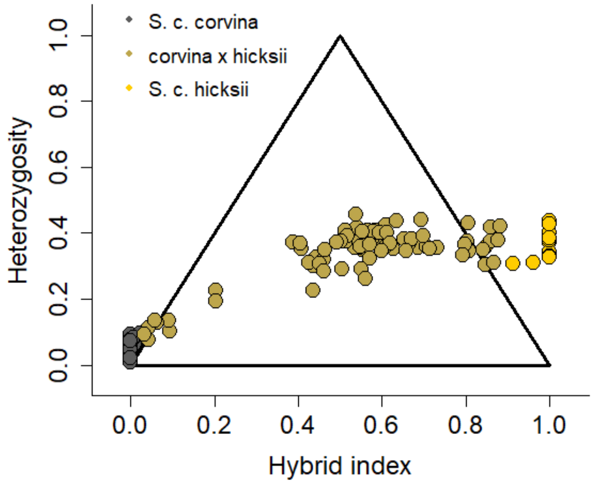


Figure 2. Pairwise characterization of the hybrid index and interclass heterozygosity between *S. c. corvina* and *S. c. hicksii* parental subspecies.

Taxonomy and nomenclature:

If approved, this split would recognize two species, *Sporophila corvina* (monotypic) and *Sporophila ophthalmica* (including subspecies *hoffmanni*, *hicksii*, and *ophthalmica*).

Recommendation:

We recommend a NO vote on this proposed split. The Tobias et al. (2010) method seems to have worked well as a first-pass approach to many of the species-limits cases that have been subsequently examined in more depth (Tobias et al. 2021). But a key weakness of the method, identified before its widespread application, is its use when the taxa hybridize, when its probability to fail to diagnose species limits correctly is increased. Winker (2010) noted: "If applied to hybridizing populations as the authors propose, examining only pure phenotypes, this error rate is likely to be higher because it unduly diminishes the importance of gene flow and the degrees of reproductive isolation achieved in secondary contact. The breadth of hybrid zones was part of the geographical scoring, but that is a poor surrogate (and was discarded in the method's development), and phenotype is not always a dependable indicator of gene flow." This is one of those cases in which application of a method that does not adequately account for hybridization in known zones of contact fails to delimit biological species.

Despite the importance of divergence in secondary sexual characters, such as plumage color and song, in reducing gene flow among species of this genus of seedeaters, current phenotypic and genomic evidence suggests extensive hybridization and gene flow between the *corvina* and *ophthalmica* groups. This pattern is demonstrated by intermediate individuals that thrive along the Canal Zone in Central Panama and neighboring regions.

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Submitted by: Diego Ocampo and Kevin Winker

Date of Proposal: 25 June 2022

Treat *Molothrus armenti* as a separate species from Bronzed Cowbird *M. aeneus*

Description of the problem:

The Bronze-brown Cowbird *Molothrus* [*aeneus*] *armenti* has remained little-known until recently, and its status as a subspecies of Bronzed Cowbird *Molothrus aeneus* rests upon the authority of one scientist, Herbert Friedmann, who, beginning with his review of cowbirds in 1927, considered it a full species, and only in 1963 decided otherwise, seemingly being swayed by his observations of a single captive individual, but without providing a rationale.

Molothrus [*a.*] *armenti* Cabanis, 1851 (based on Lichtenstein's 1826 label name) was long known from only four specimens from Cartagena and "Savanilla", Colombia (=Sabanilla, near Baranquilla), though Friedmann (1957) considered two further specimens (from Demerara, Guyana and Venezuela) to be doubtfully identified, correctly it would appear as no further reports have come from these countries. Two of the Cartagena specimens were lost and no further specimens or living individuals were found for over a hundred years, despite special effort by e.g., Dugand (1947) and Carriker (in Friedmann 1957), and the exact collection localities were uncertain. When a live adult male turned up in a shipment of cagebirds from Leticia, Amazonian Colombia, it was initially heralded as a rediscovery (Friedmann 1957), and Leticia was accepted as a genuine locality by Meyer de Schauensee (1964, 1966, 1970), who then considered the specimens from Cartagena of doubtful provenance. Subsequently, however, it became evident that the Leticia origin of the shipment was instead highly doubtful because the many collectors operating there never obtained any cowbirds, and the likelihood is that the birds were brought on board during refueling in Barranquilla, where a Leticia-based bird dealer had another operation (Camacho & Rodríguez-Mahecha 1986).

Although usually treated as a species (e.g., Friedmann 1927, 1933, Hellmayr 1937, Meyer de Schauensee 1966, 1970, Camacho & Rodríguez-Mahecha 1986, Hilty & Brown 1986, Sibley & Monroe 1993, Rada Quintero 2002, Gill & Wright 2006, Fraga 2011, del Hoyo & Collar 2016, BirdLife International 2020, Hilty 2021), some of these authors expressed doubt as to its status, and it has been considered a subspecies by others (e.g., Meyer de Schauensee 1964, Parkes & Blake 1965, Blake 1968). Then, after its 1969 rediscovery in the wild at P.N. Isla de Salamanca by Gilberto Toro-García, Dugand & Eisenmann (1983; as interpreted by Friedmann, who at least finished, or perhaps wrote the paper because both authors of record were by then deceased) examined a series from the rediscovery site and deemed that it "cannot be looked upon as other than a southernmost race of … *M. aeneus*." Dugand & Eisenmann (1983) then went on to reiterate some of the known characters by which *armenti* differs from *aeneus*, but their posthumously published opinion as to its subspecific status has been widely followed (AOU 1983, 1998; Ridgely & Tudor 1989; Dickinson 2003; Dickinson & Christidis 2014; McMullan & Donegan 2014; McMullan et al. 2018; Avendaño et al. 2017; Ayerbe-Quiñones 2019; Clements et al. 2019; Remsen et al. 2020). By 1963, Friedmann (1963) was treating *armenti* as a subspecies of *aeneus*, although without any comment as to why and without benefit of the larger series later available. The less extravagant plumage and structural features of *armenti* compared to *aeneus* were in fact used as evidence by Parkes & Blake (1965) to sink the genus

Tangavius into *Molothrus*, with the argument that *armenti* bridged the gap between Bronzed and typical cowbirds. Nevertheless, later in the same paper they stated 'Although its differences in color and proportions suggest that it might be specifically distinct, *armenti* is now considered by Dr. Friedmann to be conspecific with *aeneus*. We propose to follow his recommendation, based in part on observations of a living adult male *armenti* in the National Zoo…' (Parkes & Blake 1965). Presumably these observations of the living bird were Friedmann's, and it seems unlikely that Bronzed Cowbirds were also present simultaneously in the zoo for direct comparison. Subsequently, however, this treatment was followed by others, including the AOS classification committees. Dugand & Eisenmann (1983) did examine the larger series unavailable at the time Friedmann decided on subspecific status, but it is not clear whether the statement about its being a race of *aeneus* was theirs or was the subsequent opinion of Friedmann, who finished the manuscript for the predeceased Dugand and Eisenmann after having been sent their notes and correspondence by F. Vuilleumier (Friedmann's footnote in Dugand & Eisenmann 1983). In any case, it does not appear that convincing argumentation for the conspecificity of *armenti* with *aeneus* has been published.

No DNA-based phylogenetic studies appear to have thus far included *armenti*. Nevertheless, though it seems clear that *armenti* is closely related to *aeneus*, it is quite morphologically divergent from Bronzed Cowbird, as noted in various sources (especially Jaramillo & Burke 1999):

- Much smaller size (the smallest cowbird). For males (n=8), wing vs. the three races of *aeneus* averaged 96.5 vs. 116.5, 119.0, 108.7; culmen 16.7 vs. 23.0, 23.0, 21.3; tail 61.4 vs. 79.6, 85.0, 73.0; for females (n=8), wing 87.9 vs. 108.7, 104.5, 102.6; culmen 16.2 vs. 20.6, 19.8, 19.1; tail 59.4 vs. 73.0, 73.5, 73.5; measurements from Jaramillo & Burke 1999);
- relatively smaller bill (see Friedmann's 1933 Fig. 6) and feet; see above measurements;
- greatly reduced sexual size dimorphism;
- redder iris in adult female;
- head and body of adults of both sexes glossy brown, much like head color of male Brown-headed Cowbird;
- neck ruff present in males but much reduced;
- outer primary not emarginate, unlike Bronzed Cowbird;
- much reduced hairlike texture of breast feathers in males.

New information:

We have not had the opportunity of independently studying specimens of *armenti*. However, several photos of *armenti* are now available online on eBird, and these show that iris color of males is not consistently different from Bronzed Cowbird, though perhaps not as brilliant red, and irides of female *armenti* can be nearly as red as in males (brownish to pale orange in female *aeneus*).

Thirteen recordings of *armenti* are available as of 26 August 2021 on xeno-canto (https://www.xeno-canto.org/species/Molothrus-armenti?view=3), and while somewhat variable and similar in quality to the plentiful material there and on Macaulay Library of North to Middle

American *M. aeneus*, none share the same pattern. Its vocal distinctiveness has already been noted by Fraga (2011) and del Hoyo & Collar (2016), and it seems to be relatively quiet.

For years after its rediscovery, *armenti* was mainly reported from P.N. Isla de Salamanca (e.g., Gochfeld et al. 1980), but remained relatively little-known, and from few localities (Ridgely & Tudor 1989). However, with the growth of birding in Colombia that has changed, as can be seen from the eBird map (https://ebird.org/species/brocow; Panama records are *aeneus*), and further data and records have been enumerated in Arzuza Buelvas et al. (2017), and thus although it is now much better known, major areas of its life history, such as its host species, are still mysterious (Arzuza Buelvas et al. 2017). Donegan et al. (2016) stated that "Bronze-brown Cowbird *Molothrus armenti* is not seen east of Salamanca", but Freeman et al. (2011) and others have recorded it east to SFF Los Flamencos. It has also been reported to the west in Córdoba Department (Estela & López-Victoria 2005). Given its range restriction and evidently small population size, the species was considered Threatened (Rada Quintero 2002) or even Endangered (Fraga 2011), but has now been downgraded to Vulnerable (Renjifo et al. 2016). However, it does occur in degraded and pastoral areas and over a broader area than earlier believed. Because the range of the Bronzed Cowbird is expanding in Panama with deforestation, it seems only a matter of time before secondary contact is established between *aeneus* and *armenti*.

One putative ecological difference mentioned by several authors, the seeming lack of affinity of *armenti* for cattle (e.g., Hilty & Brown 1986, Jaramillo 1999), does not appear to hold. A known site for this species is a cattle pen along the highway near Salamanca, where D. Donsker's guide took him to see six individuals of *armenti* along with other blackbirds on 15 Mar 2012. It has even been reported in a park in downtown Magdalena ("red eye seen clearly"; https://ebird.org/checklist/S30013686), and may feed among domestic fowl (https://ebird.org/checklist/S53399078; Fraga 2011).

Most recent treatments other than HBW/BirdLife and Gill & Wright (2006) and those following these lists continue to treat *armenti* as a subspecies of *aeneus*, including in-country sources (e.g., McMullan & Donegan 2014, McMullan et al. 2018 [not seen], Donegan et al. 2015, Ayerbe-Quiñones 2019). This is likely to be largely due to historical inertia. We consider that there is a strong case for the treatment of *armenti* as specifically distinct, given its morphological and vocal differentiation, that a strong case for conspecificity was never made, and that continued subspecific status would need to be based upon evidence of which we are unaware.

English name:

The name "Bronzed Cowbird" is vastly more familiar and entrenched for the widespread North and Middle American *M. aeneus*, which was also long known as Red-eyed Cowbird (Friedmann 1957). The name Bronze-brown Cowbird is the most-used name for *armenti* (and continues to be used in the most recent field guide to Colombia, Hilty 2021), but it has also been known as Arment's Cowbird (in e.g. Hellmayr 1937), Cabanis's Cowbird (Brabourne and Chubb 1914), and Colombian Red-eyed Cowbird (Friedmann 1957). Although Friedmann (1957) quoted E. Stresemann as having informed him that *armenti* stems from the Latin word for *armentum*, meaning a drove of cattle, Jobling (2010) indicates it was named after T. Arment, a “collector in Colombia”.

Effect on AOS-CLC area:

If split, the range statement of *M. aeneus* will need to be modified to exclude the range of *M. armenti*, and *M. aeneus* becomes endemic to North and Central America.

Recommendation:

We recommend that *M. armenti* be considered specifically distinct, for the reasons stated above, and we recommend that it continue to be known as Bronze-brown Cowbird, which is highly entrenched. If voting yes for the split (part A), please also vote for an English name (part B).

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Submitted by: Pamela C. Rasmussen, Michigan State University, and David B. Donsker

Date of proposal: 26 June 2022

2023-A-11 N&MA Classification Committee pp. 650-651

Treat *Icterus fuertesi* as a separate species from Orchard Oriole *I. spurius*

Background:

Icterus fuertesi was described based on differences from *I. spurius* in size and male plumage: the underparts, rump, and lesser and median wing coverts, which are chestnut in *spurius*, are ochraceous buff in *fuertesi* (Chapman 1911):

Chapman also noted some differences in song, but he was particularly impressed by the difference in color of *fuertesi* across a relatively narrow distributional gap “with no very striking change in environment,” given the consistency in color shown by *spurius* across its much broader range. Ridgway (1902) obviously did not consider *fuertesi* in his volume on the Icteridae, but Hellmayr (1937) listed it as a species although he noted that nothing was known of it except for Chapman’s description and that “it may prove to be a southern race of the Orchard Oriole”. Blake (1968), who handled the Icteridae for the Peters Check-list, treated *fuertesi* as a subspecies of *I. spurius*, and the AOU (1983, 1998) followed this treatment when Middle America was added to our area. Howell and Webb (1995), although noting that *fuertesi* is sometimes considered specifically distinct, treated it as a subspecies of *spurius.*

In 2004, the NACC considered a proposal to treat *fuertesi* as a distinct species based on the genetic results of Omland et al. (1999) and Baker et al. (2003). Omland et al. (1999) sequenced 2005 bp of the mitochondrial genes ND2 and cytochrome-b for single individuals of *fuertesi* and *spurius* as part of a broader phylogenetic study of New World orioles. They found the two to be sister taxa, separated by minor (0.6%) sequence divergence, a level typical of intraspecific differences in species of *Icterus*:

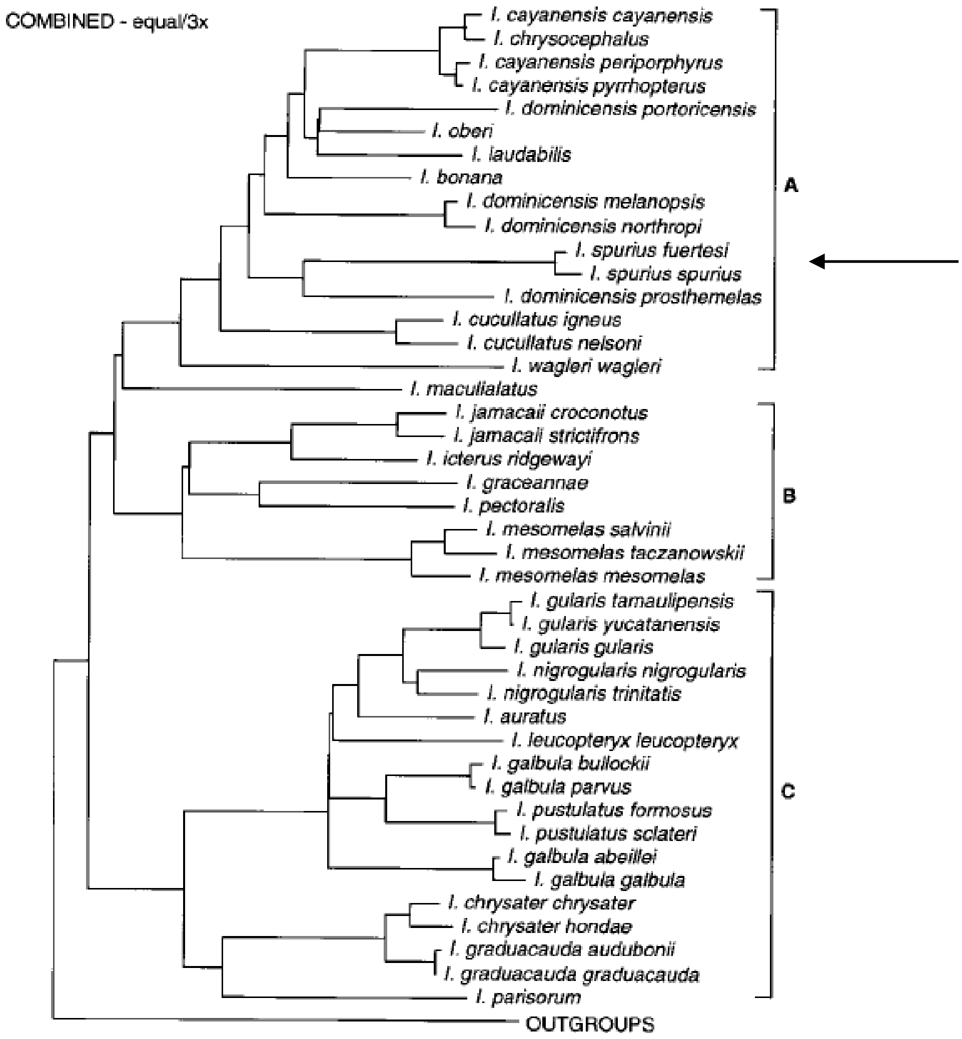

Fig. 1. Phylogram based on mitochondrial sequences of *Icterus* (from Omland et al. 1999).

Baker et al. sequenced mtDNA (925 bp of cytochrome-b and 344 bp of the control region) for 23 individuals of *spurius* and 7 of *fuertesi*. They also found very minor average mtDNA differences (0.2% in cyt-b, 0.6% in cyt-b and control region combined) but they also found that *fuertesi* and *spurius* were not reciprocally monophyletic, although there was little evidence of contemporary gene flow. They concluded that “Orchard and Fuertes’s orioles are evolutionarily distinct taxa and should be treated as separate species." Jim Rising, author of the NACC proposal, recommended that the proposed split be rejected, noting that there is little difference between the two other than in plumage, and noting further that oriole plumage is not generally conservative, citing Omland and Lanyon (2000).

New Information:

Kevin Omland and his students have produced quite a few studies on the *spurius-fuertesi* complex over the past 15 years, publishing papers on plumage, vocalizations, and genetics.

Kiere et al. (2007) conducted a quantitative analysis of plumage color in adult male *fuertesi* and *spurius* using reflectance spectrometry. They measured five individuals from each of three geographical regions for *spurius* (northeast, northwest, and southwest; n = 15) and from each of two localities for *fuertesi* (one in Tamaulipas, the other in Veracruz; n = 10):

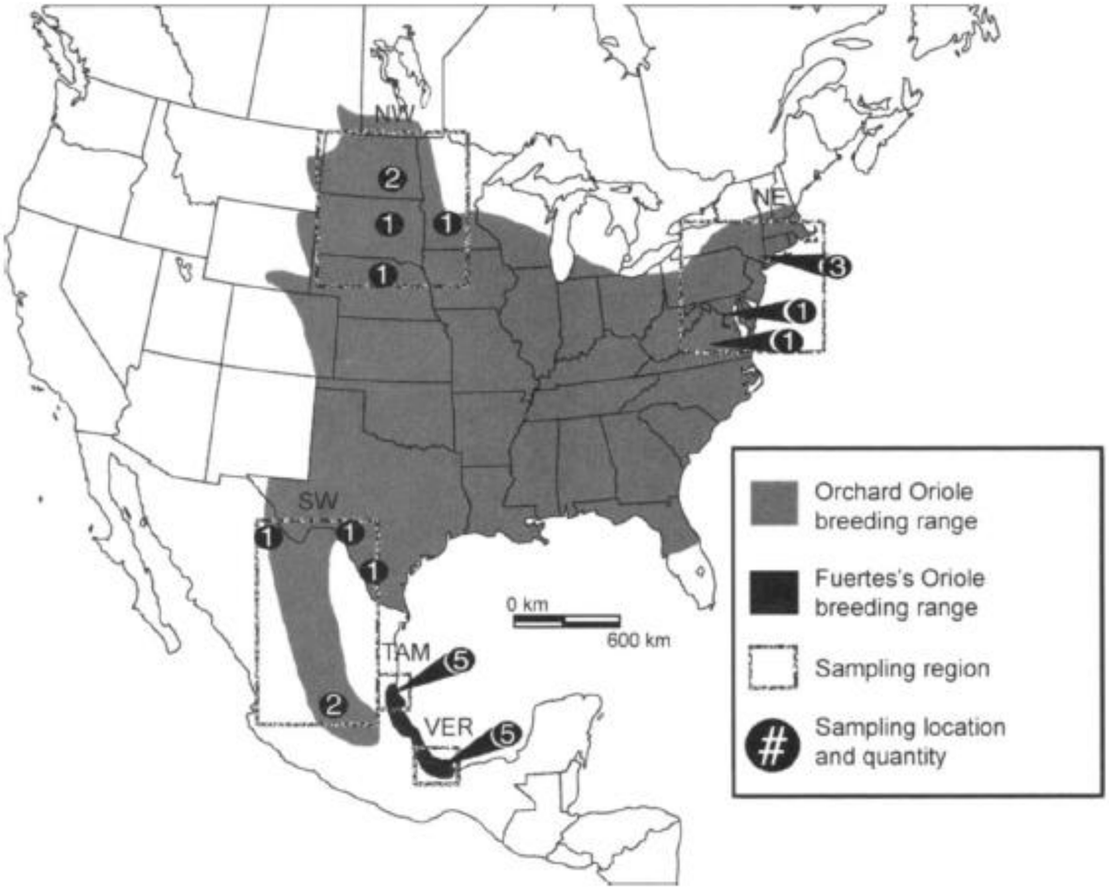

Fig. 2. Map showing specimen localities for the plumage study of Kiere et al. (2007).

They took measurements of four plumage regions from each specimen: breast, epaulet, rump, and belly. Not surprisingly, they found no overlap in coloration in the two forms. Figure 3 shows the results for breast plumage: reflectance spectra of the two forms are widely separated, and most of the variation is between forms with only minor variation within either *fuertesi* or *spurius*. For *spurius*, samples from the northeast were slightly darker, but samples from the northwest and southwest were virtually identical and there was no north-south cline. Although sample sizes were somewhat small, this is in keeping with Chapman's observation of consistency in plumage across the range of *spurius.* Kiere et al. concluded that *fuertesi* and *spurius* should be considered separate species, based on differences in mtDNA (Omland et al. 1999, Baker et al. 2003), migratory behavior and geographic range, and plumage. However, the mitochondrial differences are minor and differences in migratory behavior, geographic range, and plumage are also characteristic of subspecies.

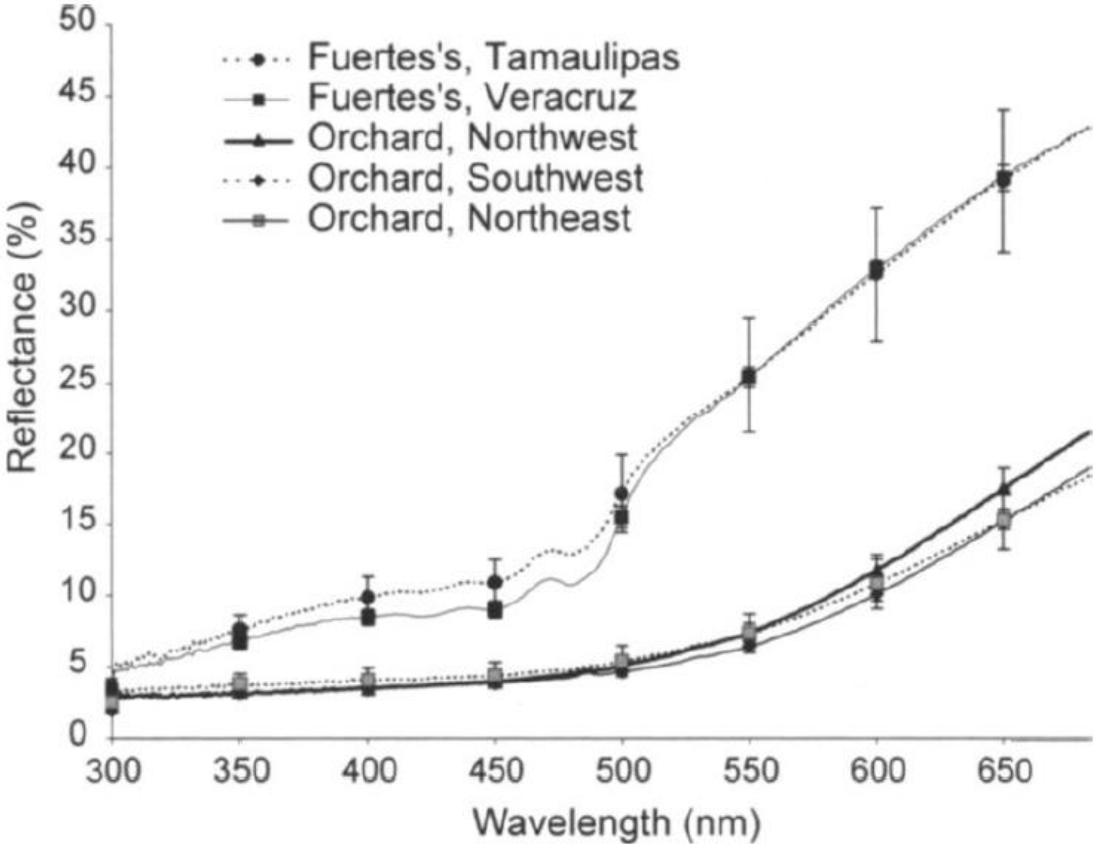

Fig. 3. Average reflectance of breast plumage of adult male specimens of *fuertesi* and *spurius.*

Hofmann et al. (2007) continued the theme of plumage coloration through a combination of reflectance spectrometry and biochemical analysis of pigmentation in the Orchard Oriole complex, based on breast and belly feathers taken from mist-netted birds (for *spurius*) or from museum specimens (for *fuertesi*). Their results indicated that both carotenoids and phaeomelanins are present in adult male feathers of both *spurius* and *fuertesi*, but that in *spurius* the carotenoids are masked by high concentrations of phaeomelanins to produce the chestnut plumage, whereas in *fuertesi* both the carotenoids and phaeomelanins contribute to the ochraceous-buff coloration. They also determined that the yellow plumages of adult females and first-year males are produced by carotenoids alone.

Hagemeyer et al. (2012) studied songs of *fuertesi* and *spurius* by assessing patterns of syllable-type sharing in songs of the two forms and between populations of *spurius*. Recording locations are shown in Fig. 4:

Fig. 4. Map of recording locations for *fuertesi* and *spurius* from Hagemeyer et al. (2012).

They found 529 distinct syllable types, 142 of which were shared among individuals, and that sharing decreased with increasing geographical distance. The number of syllable types shared between *fuertesi* and *spurius* was 26 (4.9%), which was similar to the extent of sharing between populations of *spurius.* A cluster analysis revealed that individuals of the two forms did not separate into two discrete groups but instead were intermixed (see Fig. 5 on next page).

In addition, Hagemeyer et al. (2012) found that song syllables that were also used as calls were shared more frequently between *fuertesi* and *spurius*. They suggested that syllable sharing between *fuertesi* and *spurius* is the result of either cultural exchange between the two or because the evolution of songs has lagged behind that of plumage.

Sturge et al. (2016a) extended this work through examination of songs and calls, measuring 18 acoustic characteristics of the songs, such as song duration, number of notes, average note duration, and note diversity, and 17 characteristics of the “jeet” calls. Sample sizes for songs were 19 each for *spurius* and *fuertesi*, and sample sizes for calls were 16 for *spurius* and 9 for *fuertesi*. Sturge et al. determined that songs did not differ appreciably (Fig. 6), which is consistent with the findings of Hagemeyer et al. (2012).

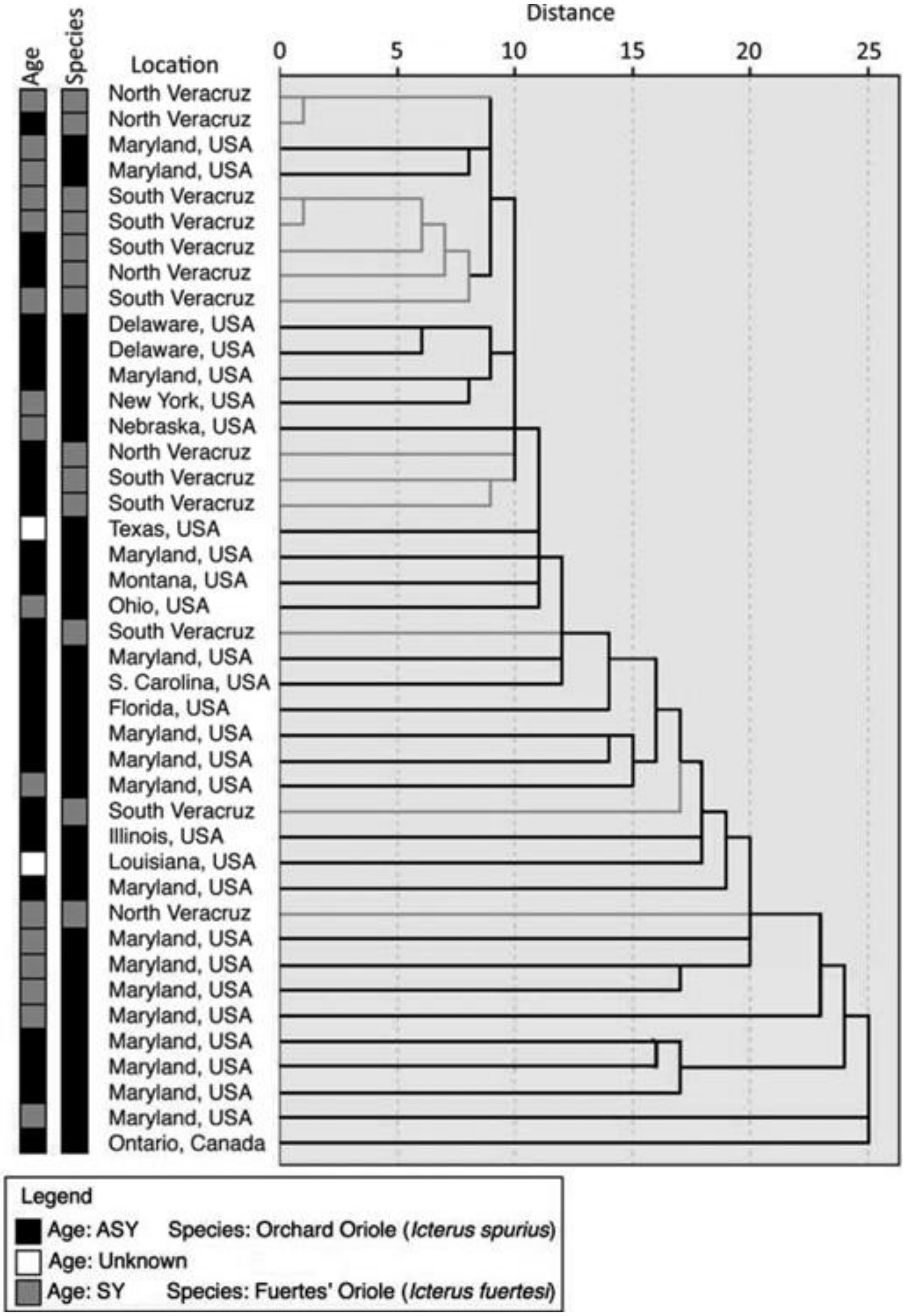

Fig. 5. Hierarchical cluster analysis dendrogram based on presence/absence of the 529 syllable types in second-year (SY) and after second-year (ASY) male Orchard Orioles (from Hagemeyer et al. 2012).

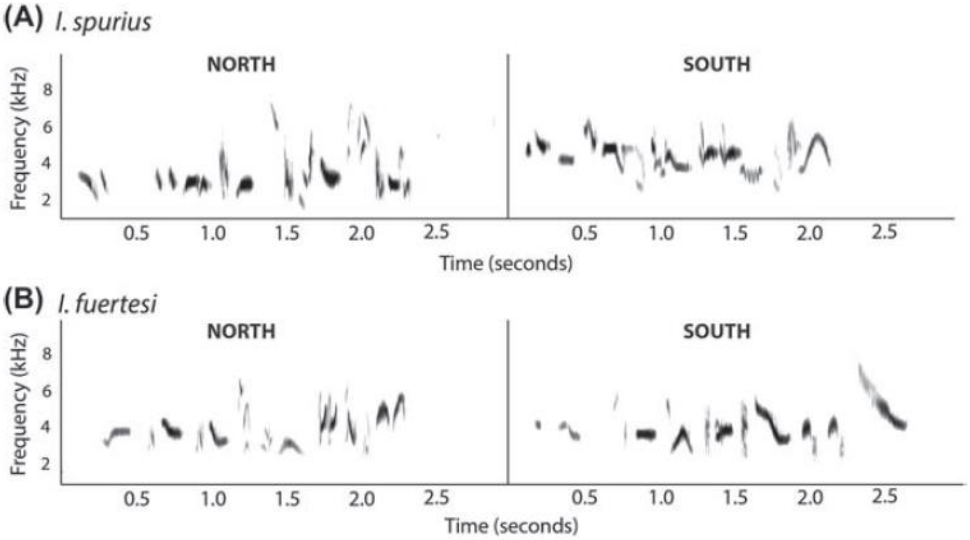

Fig. 6. Examples of songs of *spurius* (top panels) and *fuertesi* (bottom panels) from Sturge et al. (2016a).

However, they found that the “jeet” calls of *fuertesi* and *spurius* differed significantly in several characters, including duration, frequency bandwidth, minimum frequency, beginning frequency, and levels of frequency and amplitude modulation. Furthermore, calls of *fuertesi* often consisted of two parts, whereas those of *spurius* had one part:

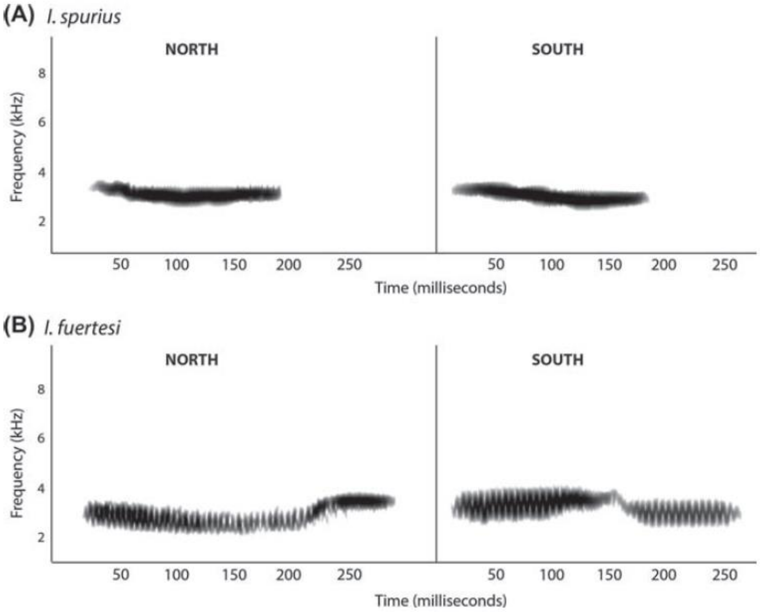

Fig. 7. Examples of “jeet” calls of *spurius* (top panels) and *fuertesi* (bottom panels) from Sturge et al. (2016a).

Unfortunately, there appear to be no examples of the “jeet” calls of *fuertesi* on either xeno-canto or the Macaulay Library websites, so we have not been able to listen to examples for comparison. However, the raw data from Sturge et al. (2016a) are available at https://datadryad.org/stash/dataset/doi:10.5061/dryad.469vn

Sorting the data in the “Raw data for jeet call analysis” spreadsheet shows that the differences in these characters, although in many cases statistically significant, are typically not diagnostic, and that the differences illustrated above are not so clear-cut when sample sizes are increased. For several characters found to differ significantly (e.g., duration, minimum frequency), the values of one or more individuals of *spurius* from Texas are intermixed with those of *fuertesi*. For other characters found to differ significantly (e.g., beginning frequency), values of more widespread individuals of *spurius* are intermingled with those of *fuertesi*. For the one vs. two syllable call types, all calls of *spurius* consisted of a single syllable, as noted, but only 5 of the 9 calls of *fuertesi* consisted of two syllables. Only a single character in the “calls” spreadsheet, “SDofFM” (presumably standard deviation of the frequency modulation), appears to diagnose *spurius* from *fuertesi*.

Finally, Sturge et al. (2016b) studied nuclear sequence data for this complex, sequencing four nuclear introns and one mitochondrial gene for 25 individuals of *spurius* and 14 of *fuertesi*. The mitochondrial data, although separating most individuals by taxon, did not support reciprocal monophyly of the two taxa, and the nuclear data “showed little evidence of population structure”. In contrast to the findings of Baker et al. (2003), they stated that “it is difficult if not impossible to determine whether gene flow is currently occurring between these two taxa or has historically occurred since their divergence.” Sturge et al. (2016b) concluded that these taxa are “in the earliest stages of speciation.”

Recommendation:

Despite much exemplary work on this complex by Kevin Omland’s lab group, the situation regarding biological species status is much the same as it was when Jim Rising noted that there is little difference between the two other than in plumage. Vocalizations overlap and genetic differences are minor and typical of intraspecific differences in this genus. The plumage differences, as noted by Hellmayr, do not convincingly indicate species-level differences in allopatric taxa, although the distributional gap is narrower than between many species. Furthermore, plumage patterns and colors as well as song characters appear to be highly labile in *Icterus* (Omland and Lanyon 2000, Price et al. 2007). Thus, plumage and song may not be reliable species-level characters in this group. For these reasons, we recommend that the committee reject the proposed separation of *Icterus fuertesi* from Orchard Oriole *I. spurius*.

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Submitted by: Terry Chesser and Carla Cicero

Date of Proposal: 26 June 2022

Treat *Chlorothraupis frenata* as a separate species from Carmiol's Tanager *C. carmioli*

Description of the problem:

Chlorothraupis carmioli (Lawrence, 1868) is a polytypic species broadly comprised of two subspecies groups; a northern group of three subspecies (*carmioli*, *magnirostris* Griscom, 1927, and *lutescens* Griscom, 1927) found in lowland and foothill tropical forests from Honduras to extreme northwestern Colombia, and another group consisting of the South American subspecies *frenata* von Berlepsch, 1907, found in the eastern foothills of the Andes from southern Colombia to central Bolivia (Hilty 2022). Although these two subspecies groups are highly disjunct, the intervening regions are occupied by two congeners; *C. olivacea* (Cassin 1860) of the lowlands and foothills of western Colombia and northwestern Ecuador (the Chocó) and just reaching far eastern Panama, and *C. stolzmanni* (von Berlepsch & Taczanowski 1884) of the same region but replacing *olivacea* at higher elevations and not reaching Panama (Hilty 2020a, b). Within Central America, the two southern subspecies are somewhat more yellow and larger-billed in western Panama (*magnirostris*) and much more yellow and smaller-billed in eastern Panama (*lutescens*) than nominate *carmioli*, which is found from Costa Rica north (Griscom 1927). For simplicity, I'll refer to these three northern subspecies as the *carmioli* group throughout this proposal.

The current species-level treatment is largely unchanged since each of the taxa was described. The two taxa first described, *C. olivacea* and *C. carmioli*, were each considered species by the describing authors, and by most subsequent authors (e.g., Dickinson 2003). The ranges of the two approach each other in eastern Panama and apparently don't show signs of hybridization. Ridgely and Gwynne (1989), specimen data on VertNet, and occurrence records in eBird all indicate that *C. olivacea* is found on the eastern Darién mountains of Cerro Sapo, Pirre, Quía, and Jaqué, but is replaced on Cerro Tacarcuna by *C. carmioli*. *C. carmioli frenata* was described as a subspecies of *carmioli* by von Berlepsch. von Berlepsch's (1907) reasoning for maintaining *frenata* as a subspecies of *carmioli* is worth reproducing here in full:

> It is a curious fact that the *Chlorothraupis* of South-eastern Peru has its nearest ally in a species which, as far as we know, is restricted to the forest-region of Costa Rica. In fact, the resemblance between Costa Rican and Peruvian examples of this *Chlorothraupis* is so great that Messrs. Sclater and Salvin have not attempted to separate them.
>
> In the meantime, having (through the kindness of the Hon. W. Rothschild) had an opportunity of comparing five adult birds, collected by Mr. Underwood in Costa Rica, with my specimens from Marcapata, South-east Peru, collected by Mr. O. Garlepp, I have detected some small though apparently constant characters, by which the Peruvian birds may well be distinguished.
>
> In the latter the lores and the small feathers of the frontal line near the nostrils are yellowish (purer and brighter yellow in the younger and more greenish-yellow in the adult specimens), while in the Costa Rican birds these parts are of the same dark olive-green as the upper part of the head.

> Further, the general coloration of the upper and under parts of the body of the Peruvian birds is of a clearer and purer green, while the Costa Rican birds show a rather more oily or brownish tint in the plumage. The alar margin and the under wing-coverts in the Peruvian specimens are of a clearer or more a yellowish-green colour. The tail is of a rather brighter green or less blackish.
>
> As a rule the wings and the tail in the Peruvian birds appear to be a little shorter.

The yellow color of the lores is the main plumage character that separates *C. olivacea* and *C. carmioli*, although the differences in that comparison are much more extreme, and give the former species its English name, Lemon-spectacled Tanager. Many authors (e.g., AOU 1983, 1998; Isler & Isler 1987) gave *C. carmioli* the English name Olive Tanager, but the NACC (following Meyer de Schauensee 1970, Dickinson 2003, and others) changed the English name to Carmiol's Tanager to avoid confusion with *C. olivacea* (Banks et al. 2008). The SACC also adopted this change and recommended that "Olive Tanager" be restricted to classifications that treat *C. olivacea* and *C. carmioli* as conspecific (Remsen et al. 2022), as the former has priority and would keep a match between the English and Latin names. However, I am unable to find any authors that treat these two species as conspecific, although I could be overlooking older references.

Zimmer (1947) summarized the plumage differences between the *carmioli* group, *frenata*, and *olivacea* better than I am able, and it appears little has been done on morphological differences in the complex since:

> The wide separation of the range of this form [=*frenata*] from that of the other members of the species is curious, especially in view of the occupation of the intervening terrain by *C. olivacea* and *C. stolzmanni*. Both of these last-mentioned forms appear to be specifically distinct from *carmioli* with which no intergradation of characters has been discovered at any point. The three species are undoubtedly quite closely related. The pale lores of *frenata* might be considered as suggesting the bright yellow lores of *olivacea*, although the equally conspicuous yellow eye ring of *olivacea* is not similarly suggested, and the resemblance in the color of the lores is not very striking, quite aside from the fact that *olivacea* and *carmioli lutescens* occur very near to each other in eastern Panamá.

Despite the plumage similarity between the two taxa, some recent authors have elevated *frenata* to the species rank (Ridgely and Greenfield 2001, Restall et al. 2006, del Hoyo and Collar 2016). Ridgely and Greenfield (2001) treated *frenata* as a species based on descriptions of the voice and the disjunct distribution, and del Hoyo and Collar (2016) did the same, with the following reasoning:

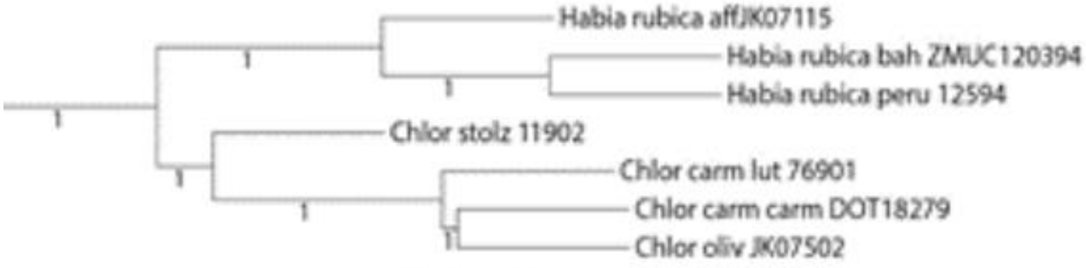
> Often treated as conspecific with *C. carmioli*, the two being morphologically very similar, but quite easily separated by their different vocalizations, including song; further investigation desirable. Monotypic.

The IOC elevated *frenata* to species rank, and gave *C. frenata* the English name Olive Tanager, and left *C. carmioli* with the English name of Carmiol's Tanager.

New information:

Barker et al. (2015) sampled the three species of *Chlorothraupis* and found that *olivacea* and *carmioli* were sisters, and that the three *Chlorothraupis* were embedded within *Habia* (separate proposal needed for generic limits). The sample of *carmioli* was obtained from Burns (1997) and is a specimen of *frenata* from San Martín, Peru (LSUMZ B-5510). Klicka et al. (2007) recovered the same topology, using a sample of *frenata* from Ecuador. No other genetic data appear to be published for this complex, and none from nominate *carmioli* or the other Central American subspecies. Both studies were based on a few mitochondrial and nuclear loci. A screenshot of the Barker et al. (2015) phylogeny is below.

A recent master's thesis (Scott 2022), focused on the Cardinalidae, sampled all species of *Chlorothraupis*, including one sample from Peru (*frenata*) and one from Panama (*lutescens*) and sequenced 5,022 UCE loci. Concatenated and coalescent gene tree methods both recovered the same topology, which shows that *Chlorothraupis carmioli* is paraphyletic. I have included the portion of the tree below that includes the *Chlorothraupis* taxa. This is the summary of the "multispecies coalescent gene trees produced by IQ-tree and summarized using ASTRAL", which includes branch lengths (unlike some of the other methods used in the thesis), and branch numbers refer to posterior probabilities.



Note that "Chlor carm carm", i.e. "*carmioli*", is mislabeled and in fact refers to *frenata* based on sampling locality. The sampling table is included below for reference.

Chlorothraupis carmioli carmioli	tissue	AMNH	DOT-18279	Peru: Ucayali: Reserva comunal El Sira; Quebrada Tambo
Chlorothraupis carmioli lutescens	tissue	UWBM	76901	Panama: Provincia de Panamá; Panama City
Chlorothraupis olivacea	tissue	UWBM	JK07-502	Panama: Darien
Chlorothraupis stolzmanni	tissue	LSUMZ	11902	Ecuador: Esmeraldas Province

Van Remsen has graciously photographed a series of specimens of *magnirostris, olivacea*, and *frenata* housed at the LSUMZ. Photos are below. In both photos, the taxa shown are (top to bottom): *magnirostris*, two *olivacea*, and *frenata*. Note the more extensive yellow spectacles and darker coloration of *olivacea*, and the slightly more yellow lores of *frenata*.

Although much of the early work on the complex highlighted the minor, albeit consistent, plumage differences, the main differences between the two clades is in vocalizations. However, no publications have quantified these differences as far as I am aware, and this group was not included in Boesman's Ornithological Notes. A detailed description of the vocalizations is given in Hilty (2022):

> Dawn song a rapid stream of mostly short notes, some grating or wheezy, some musical, and typically given rapidly in groups of 3–8, then abruptly switching to another type of note, entire sequence often lasting up to several minutes; some song sequences consist of clear whistled notes much like those of Northern Cardinal (*Cardinalis cardinalis*). Can be rather noisy when foraging, uttering variety of mostly short, high, thin notes, including *chay*, a squeaky *eep*, a churring *wrsst*, and abrupt *chut*, squeezed *chee* and metallic *whit*; also a slightly buzzy *seeet* or *seee-seeee* and staccato *tik* in bursts when about to fly; in alarm a scratchy *nyaaah* or *cheeyah*.
>
> Songs and other vocalizations of *frenata* are rather unlike those of the Central American subspecies. In southeastern Peru, *frenata* makes an excited, rapid rolling *ki'r'r'rup-ki'r'r'rup-ki'r'r'rup-ki'r'r'rup-ki'r'r'rup...*, sometimes up to ca. 8 notes in the series with squealing, frantic quality, and often repeated over and over at short intervals. At times song more varied, with other high or squeaky notes inserted into the long series, e.g. *ki'r'r'rup-ki'r'r'rup-ki'r'r'rup-éé-kir'r'r'r-éé-kir'r'r'r*, *squik-Skeek-Skeek–Skeek-kir'r'r-kir'r'r...* and so on for up to 30 seconds or more; also transcribed

> as a grating *kettup* or *keetup*. A somewhat more melodic song (context uncertain) is a series of several similar notes, then a series of different notes, and so on: e.g., *chow-chow-chow-chow-chi-chi-chi-chow, chow, chow, whi-chow, whi-chow, wheeup, wheeup, wheeup, wheeup, tic-chow, tic-chow, tic-chow, tic-chow, tic-tic-tic-tic-ch-ch-ch-ch...*, for 10–25 seconds.

The songs of the *carmioli* group and *frenata* are clearly analogous; both are run-on series of very cardinalid-like whistled notes. The primary difference, to my ear, between the songs of the two groups is the much more rapid delivery (note pace) of the songs of the *carmioli* group. Although Hilty (2022) mentions that *frenata* gives a more rolling "*ki'r'r'rup*" song, this seems to be variable, and many (perhaps most) individuals of *frenata* give more clear whistled songs, as noted by Schulenberg et al. (2007). Overall, note pace seems to be fairly consistent across the distribution of each group.

Songs of the *carmioli* group:

https://macaulaylibrary.org/asset/25644
https://macaulaylibrary.org/asset/201575871
https://xeno-canto.org/271178

versus these of *frenata*:

https://macaulaylibrary.org/asset/101818 (this one contains more "*ki'r'r'rup*" notes)
https://macaulaylibrary.org/asset/224539281
https://macaulaylibrary.org/asset/238023
https://xeno-canto.org/449151

Both taxa give a wide variety of other calls (see text from Hilty 2022 above), but differences between the two groups seem primarily to be a lower-pitched scolding call in *frenata*.

carmioli group*:*

https://macaulaylibrary.org/asset/165887
https://macaulaylibrary.org/asset/203938651
https://macaulaylibrary.org/asset/211144
https://xeno-canto.org/271177

frenata:

https://macaulaylibrary.org/asset/138819
https://xeno-canto.org/610638
https://xeno-canto.org/449150
https://xeno-canto.org/118229

For reference, the song of *C. olivacea* is more like that of *frenata* in terms of pace:

https://macaulaylibrary.org/asset/149272491

Effect on AOS-CLC area:

Splitting *frenata* from the *carmioli* group would add no new species to the checklist area, as *frenata* is extralimital.

Recommendation:

I recommend a YES vote on splitting *frenata* from the *carmioli* group. *C. carmioli* would retain *magnirostris* and *lutescens* as subspecies. The nuclear data from Scott (2022) show that the current definition of *C. carmioli* is paraphyletic, with *C. c. frenata* sister to *C. olivacea*, and with fairly long branches separating the three groups. In addition, the plumage differences are minor but consistent, and parallel with other species-level differences in the group (albeit to a lesser degree). The vocalizations are also consistently different, and seem to not vary considerably across the distribution of each group (just in my cursory listening of recordings – an analysis is certainly needed!), despite the wide range of different vocalizations given by these taxa.

Please vote on the following:

1) elevate *frenata* to species rank

If *frenata* is elevated to species rank, new English names will be required. Clement's / Birds of the World (2022) uses Carmiol's Tanager for the *C. carmioli* group and Yellow-lored Tanager for *C. carmioli frenata*. Although Carmiol's Tanager has long been used for the combined species, no other names have been used for the northern group and keeping Carmiol's would maintain a match with the species epithet. The two groups have roughly comparable range sizes, likely a slightly larger distribution in *frenata*, so keeping Carmiol's Tanager with *C. carmioli* does go against NACC guidelines. However, it does seem like an option to me in this case. Olive Tanager has been used for *C. carmioli* s.l. (see citations above) but the NACC changed the name from Olive Tanager to Carmiol's Tanager in 2008 specifically to avoid confusion with *C. olivacea* (Lemon-spectacled Tanager), so applying that name to *C. carmioli* s.s. seems like a poor choice. The IOC, in elevating *frenata* to species rank, gave it the name Olive Tanager (see above), but that, too, seems like a poor choice that only adds to the confusion regarding the application of the name "Olive Tanager". If Carmiol's is unacceptable to the committee as the English name for *C. carmioli* s.s., a separate proposal will be needed to address the English name of that taxon. The namesake of *carmioli* is Francisco Carmiol, a German immigrant to Costa Rica who worked as a bird collector for the Smithsonian and collected the type specimen of *carmioli* (Lawrence 1868, Billerman et al. 2022). Francisco was the son of the bird collector Julián Carmiol, for whom *Vireo carmioli* is named (Billerman et al. 2022), but little else appears to be published about the two Carmiols. Alternatively, Yellowish Tanager or Yellow-olive Tanager seem like decent options for *C. carmioli* s.s., would highlight the more yellow coloration of at least some populations of the *carmioli* group, and would be parallel to Yellow-lored and Lemon-spectacled Tanagers. Olive-green Tanager is occupied by *Orthogonys chloricterus*.

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Submitted by: Oscar Johnson, The University of Texas at El Paso

Date of proposal: 26 June 2022, revised 1 March 2023

Treat *Melopyrrha taylori* as a separate species from Cuban Bullfinch *M. nigra*

Recent Background:

This proposal is prompted by the differing treatment of these taxa by the BL-HBW list, which considers them separate species, vs. the other global lists (e.g., Clements, IOC). This discrepancy will result in consideration of this issue by the IOU's Working Group on Avian Checklists (WGAC). The BL-HBW rationale for species status for *taylori* is as follows: "Usually considered conspecific with *M. nigra* (as in HBW), but differs in its deeper culmen (effect size, 2.56, score 2); smoky-brown vs. blackish-slate underparts in female (2); silvery-grey vs. all black bill in male (1); shorter song with fewer elements and at lower frequencies in first two seconds (at least 2) (Garrido et al. 2014)."

The NACC considered a motion for this split in 2016 (2016-A-5), which failed on a 5-5 vote. In view of the pending WGAC action and on the merits itself, here we revisit the issue.

Historical Overview:

According to AOU (1998), *M. nigra* was described as *Loxia nigra* by Linnaeus (1758) based on the "The Little Black Bullfinch" of Catesby, Nat. Hist. Carolina 1:68, pl. 68 and "The Black Bullfinch" Albin, Nat. Hist. Birds 3:65, pl. 69. (in America australi = Cuba.). Bonaparte described the genus *Melopyrrha* in 1853 and Gray designated *nigra* as the type species in 1855*.*

Garrido et al. (2014) detailed the late 19th century history of *Melopyrrha nigra* and, in particular, the discovery of a new taxon on Grand Cayman. Along with information in Bradley (2000), a clearer overview emerges about the Grand Cayman taxon. Bradley's (*ibid*) illustrated color cover of her BOU Checklist shows two males and one female *M. n. taylori* from a painting from her own collection by John P. O'Neill. She is one of the co-authors of Garrido et al. (2014).

Gundlach (1856, 1876) was unaware that the range of *Melopyrrha nigra* extends to the Cayman Islands because the avifauna of the Cayman Islands was unexplored until the last few decades of the 19th century. Cory (*fide* Bradley 2000), a wealthy amateur ornithologist, rectified this: he visited the Bahamas in 1878 and, beginning in 1886, sent collectors, including William B. Richardson, Charles J. Maynard, C. P. Streator, D. J. Sweeting, and Charles H. Townsend, to Grand Cayman, Little Cayman, and Cayman Brac. One or more of those collectors obtained specimens of a species of *Melopyrrha* which were assumed by Cory (1886, 1892) and later Gundlach (1893) to be *nigra*, although Gundlach may not have seen the specimens. Charles B. Taylor of Jamaica later collected on Grand Cayman, between 14 March and 21 April 1896, for Rothschild's museum at Tring (most of Taylor's collection was sold to the AMNH in 1931). Ernst Hartert (1896), originally the curator of the Senckenberg Museum in Germany, then Director of Tring, realized that these Grand Cayman specimens differed significantly from the Cuban birds, and described the former as a new species, *Melopyrrha taylori*. Hartert's (1896) account:

> Speciei *M. nigra* dictae similis sed major, ♂ nitore metallico minuto. Long. tot cr. 145; al. 70-72 (*M. nigra*, 64-66); caud. 65-68 (*M. nigra* 53-54); culm. 14-15 (*M. nigra* 12); tars 17-18 mm.
> Hab. Grand Cayman.

Hartert (1896) continued in a descriptive paragraph:

> This species resembles *M. nigra* of Cuba, but is decidedly larger, and has much less of the metallic bluish green steel-gloss of *M. nigra.* A fine series was collected by Mr. C.B. Taylor of Jamaica, to whom I dedicate this species. Cory and others have already recorded this bird from Cayman, and it is to be wondered that they did not separate it from the Cuban form, as they described some species from Cayman which are hardly more distinct than this, and as our American friends cannot, as a rule, be blamed with "lumping." The adult female is strongly washed with brownish gray and without gloss. Young birds of both sexes are ashy brown. I do not think the genus *Melopyrrha* can be upheld, but I use it for the present, without being able to go critically into the question.

We would add that Hartert shouldn't be accused of being a splitter. He lumped White-winged Scoter as a single polytypic species with three subspecies a few decades later.

Ridgway (1901) included separate species accounts for *nigra* and *taylori*. These accounts contained detailed descriptions and measurements. His account for *M. taylori* states: "Similar to *M. nigra* but decidedly larger; adult male less glossy black, with the gloss rather greenish than violet-bluish, the primary coverts wholly white, and (in fresh plumage) the lateral retrices margined terminally with grayish white; adult female and immature male much lighter in color than in *M. nigra,* the general color dull slate, tinged with olive, darker on the head and much lighter (olive-grayish) on posterior under parts." Ridgway used the English names Cuban Bullfinch for *M. nigra* and Grand Cayman Bullfinch for *M. taylori.* As is typical, Ridgway included measurements for both taxa, 13 specimens of nigra (six males, seven females) and 6 specimens of *taylori* (three males, one an immature, and three females)

Garrido et al (2014) noted that the two-species treatment was followed for several decades (e.g., Lowe 1910, Bond 1936). It was apparently Hellmayr (1938) who first considered the two to be conspecific, with a short footnote on p. 168 for *taylori*: "While easily distinguished by larger size and less glossy plumage, is clearly a geographical race of the Cuban Bullfinch." Garrido et al. (2014) indicated that nearly all authorities since 1940 have treated *Melopyrrha nigra* as a single species consisting of *M. p. nigra* from Cuba and *M. p. taylori* from Grand Cayman (e.g., Bond 1940, Paynter & Storer 1970, Garrido & García Montaña 1975, Sibley & Monroe 1990, AOU 1983 & 1998, Raffaele et al. 1998, Bradley 2000, Dickinson 2003, del Hoyo et al 2011, Dickinson & Christidis 2014, and Kirkconnell et al. 2020), presumably based on the treatment in Hellmayr (1938). Raffaele et al. (2020), however, treated *nigra* and *taylori* as separate species. Dickinson & Christidis (2014) included a footnote about *M. p. taylori*, stating it might be a separate species based on Bradley (2000), but although that source is full of useful information, including on bullfinches, we found no evidence for or advocacy of a split. Presumably Dickinson and Christidis (2014) would have added Garrido et al. (2014) to the footnote had they been aware of it, and may have split the two based on this publication.

"New" Information:

There is little new information *per se* since the 2016 NACC proposal, but here we review the reasons for the Garrido et al. (2014) reevaluation of Hellmayr's 1938 lump. Near the outset they stated: "Our investigation was stimulated by a birdwatcher who informed AK [Arturo Kirkonnell] that he has the impression that Cuban and Grand Cayman bullfinches had different songs. His observations were correct, but we learned that not only are the vocalisations different, but the birds are morphologically distinct as well. Here, we describe the distinctions between the two populations and present the conclusions we draw based on those differences." This they do, but many of the distinctions had already been noted, although apparently no one, certainly not Hellmayr, was aware of potential vocal differences. It goes to show that amateur ornithologists can, and do, make very real contributions to the field of ornithology; in this case their comments led to further important research. Garrido et al. (2014) did not indicate who this person was or when they received the information.

Morphology.—Garrido et al. (2014) measured 356 specimens from Cuba and 83 from Grand Cayman, although only the 211 adults were used their analyses. They measured wing, tail, culmen length, culmen width, culmen depth, tarsus, and mass. Culmen width and depth in females from Grand Cayman were diagnostically larger than in those from Cuba, and culmen depth in males overlapped only slightly (see Table 1 on next page) Note, however, that sample sizes for these measurements were vastly smaller than the 211 given above. Differences in quite a few other morphometric characters were significant but not diagnostic (see Table 2).

Adult males of both taxa (see photos below) are a uniform black with white patches in the wings, but males of *nigra* are a glossy black whereas males of *taylori* are duller and lack the gloss. The most obvious difference, however, is in female plumage, which is dull black in *nigra* but blackish-gray to slate gray below and grayish-brown above in *taylori*. Thus, *taylori* shows greater sexual dimorphism in plumage than does *nigra*.

Garrido et al. (2014) stated that *nigra* and *taylori* "show different bill coloration: that of *nigra* is all black whereas that of *taylori* is silvery grey." Although BL-HBW incorporated this prominently into their rationale for treating *taylori* as a separate species, bill coloration in photos on the Macaulay Library website appears to range from gray to black for both species, perhaps due to different lighting conditions. RTC checked specimens in the USNM and again found a similar range of bill coloration in both taxa, ranging from dark gray to black.

TABLE 1

Mean, standard deviation, range and sample size (in brackets) for measurements of wing, tail, culmen, tarsus, and mass from 211 *Melopyrrha nigra* specimens from Cuba and Grand Cayman, examined in nine collections in the USA and Cuba[1] and live mist-netted birds (mass only).

			Measurement (mm)			
Wing	Tail	Culmen length	Culmen width	Culmen depth	Tarsus	Mass (g)
			Males			
Cuba						
66.1 ± 2.2 (79)	57.6 ± 2.6 (75)	11.3 ± 0.9 (77)	9.8 ± 1.0 (16)	4.9 ± 0.5 (13)	17.6 ± 1.2 (78)	15.6 ± 1.1 (39)
60.5–73.0	52.0–67.0	9.1–14.9	8.5–11.4	4.6–5.6	15.0–21.4	13.4–17.9
Grand Cayman						
70.4 ± 2.9 (55)	58.0 ± 3.0 (57)	12.9 ± 0.7 (60)	10.8 ± 0.5 (31)	6.2 ± 0.5 (20)	20.4 ± 1 (47)	17.2 ± 0.8 (7)
65.0–79.0	53.–67.0	10.7–15.0	9.7–11.9	5.6–7.1	18.0–22.8	16.1–18.6
			Females			
Cuba						
63.9 ± 2.2 (48)	54.5 ± 3 (49)	10.9 ± 0.6 (48)	8.9 ± 0.6 (10)	4.6 ± 0.5 (6)	17.2 ± 1.1 (49)	14.5 ± 0.6 (31)
59.0–70.0	45.0–63.0	9.6–12.3	8.0–9.9	4.4–4.9	15.0–19.9	13.5–16.0
Grand Cayman						
68.0 ± 2.1 (21)	56.4 ± 2 (23)	12.5 ± 0.8 (21)	10.5 ± 0.5 (8)	5.6 ± 0.5 (7)	20.5 ± 0.6 (20)	15.7 ± 0.3 (4)
64.0–72.0	53.0–61.0	11.0–14.0	10.0–11.2	5.3–6.0	19.1–22.0	15.4–16.0

[1] Collections examined include Louisiana State University Museum of Natural Science, Baton Rouge; Museum of Comparative Zoology, Harvard University, Cambridge, MA; American Museum of Natural History, New York; National Museum of Natural History, Smithsonian Institution, Washington DC; Academy of Natural Sciences of Philadelphia, Philadelphia; Carnegie Museum, Pittsburgh; Field Museum of Natural History, Chicago; and Instituto de Ecología y Sistemática, and Museo Nacional de Historia Natural de Cuba, La Habana.

TABLE 2

Morphometric comparisons between populations of *Melopyrrha nigra* from Cuba and Grand Cayman, Cayman Islands. Comparisons made with unpaired t-test, with significance level set at 0.05. Level of significance: ** = < 0.01, and *** = < 0.001; ns = not significant.

			Measurement (mm)				
Locality	Wing	Tail	Culmen length	Culmen width	Culmen depth	Tarsus length	Mass (g)
			Males				
Cuba	66.1 ± 2.2 (79)	57.6 ± 2.6 (75)	11.3 ± 0.90 (77)	9.8 ± 1.0 (16)	4.9 ± 0.5 (13)	17.6 ± 1.2 (78)	15.6 ± 1.1 (39)
vs. (t [df] *P*)	9.755 (132) ***	0.8190 (130) ns	11.350 (135) ***	4.594 (45) ***	7.298 (31) ***	13.427 (123) ***	4.81 (10) ***
Grand Cayman	70.4 ± 2.9 (55)	58.0 ± 3.0 (57)	12.9 ± 0.70 (60)	10.8 ± 0.5 (31)	6.2 ± 0.5 (20)	20.4 ± 1.0 (47)	17.2 ± 0.8 (7)
			Females				
Cuba	63.9 ± 2.2 (48)	54.5 ± 3.0 (49)	10.9 ± 0.6 (48)	8.9 ± 0.6 (10)	4.6 ± 0.5 (6)	17.2 ± 1.1 (49)	14.4 ± 0.6 (31)
vs. (t [df] *P*)	7.219 (67) ***	2.758 (70) **	9.182 (67) ***	6.040 (16) ***	3.595 (11) **	12.634 (67) ***	7.25 (7) ***
Grand Cayman	68.0 ± 2.1 (21)	56.4 ± 2.0 (23)	12.5 ± 0.8 (21)	10.5 ± 0.5 (8)	5.6 ± 0.5 (7)	20.5 ± 0.6 (20)	15.7 ± 0.3 (4)

Ventral, dorsal, and lateral photos are here (arranged as follows: *nigra* male and female, *taylori* male and female):

Garrido et al. (2014) stated that *nigra* and *taylori* “show different bill coloration: that of *nigra* is all black whereas that of *taylori* is silvery grey.” Although BL-HBW incorporated this prominently into their rationale for treating *taylori* as a separate species, bill coloration in photos on the Macaulay Library website appears to range from gray to black for both species, perhaps due to different lighting conditions. RTC checked specimens in the USNM and again found a similar range of bill coloration in both taxa, ranging from dark gray to black.

Vocalizations.—Garrido et al. (2014) also examined vocalizations, which they described as follows, citing Bradley and Rey-Millet (2013) for Grand Cayman and Garrido and Kirkconnell (2000) for Cuba:

Grand Cayman call: “insect-like *chi-p* and *zee zee*, the first note high-pitched”
Cuba call: “a staccato *chi-dip*, and thin *tsee*, often repeated”

Grand Cayman song: “begins as a trill *zee-zee-zee*, falls briefly then rises over 8-30 *tssi* notes, the longest reaching a very high and barely audible pitch”
Cuba song: “a thin prolonged melodious warble, *ti-ti-tisissiiiitssiiiitsiiii-toeee*”

Their analyses of songs, based on sample sizes of 10 for Cuba and 46-47 for Grand Cayman (depending on the character), indicated that songs of the Cuban birds are typically more complex, significantly longer (although with a great deal of overlap: Cuba 2.32-6.25, Grand Cayman 1.11-3.98), and comprise significantly more elements (again with much overlap: Cuba 13-33, Grand Cayman 9-23). They also stated that songs of birds from Cuba reach higher frequencies during the first two seconds of the song than do those of birds from Grand Cayman, although no quantification of this character was provided. It, too, is almost certainly not a diagnostic or perhaps even significant character (see examples from Macaulay Library below):

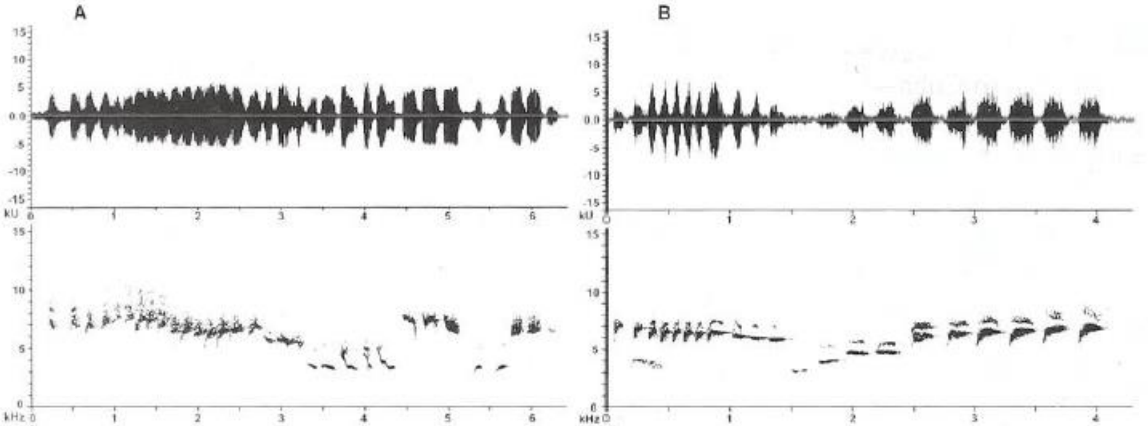
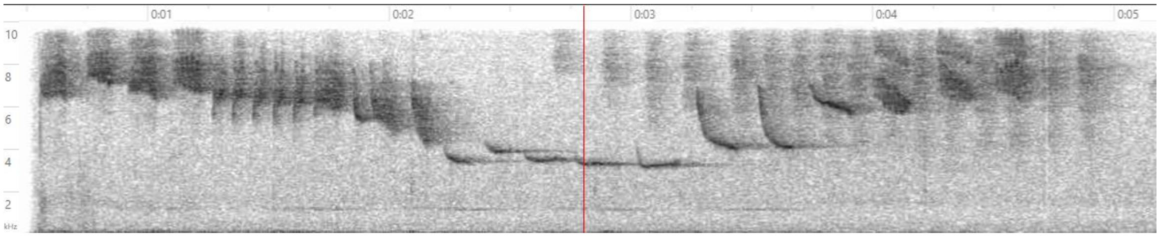
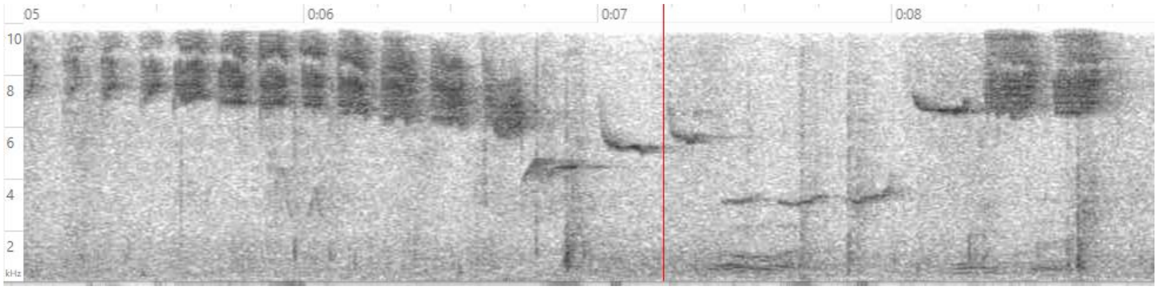


Figure 4. Song of Cuban Bullfinch *Melopyrrha nigra* from Santo Tomás, Ciénaga de Zapata, Cuba, recorded by G. B. Reynard (A) and an adult male at Queen Elizabeth Botanic Park, Grand Cayman, Cayman Islands, 16 May 2010, recorded by Alexandra Günther-Calhoun (B). Upper figure is waveform (kU), lower figure is spectrogram (kHz).

There are several recordings of these taxa on Macaulay Library and xeno-canto. ML and x-c have five recordings of songs from Cuba and seven recordings of songs from Grand Cayman. Fourteen ML or x-c recordings from Cuba consist of calls but there is only one recording of a call from Grand Cayman and it is difficult to identify homologous calls from the available recordings. The songs of the two taxa appear to be similar in that both begin with a high frequency section, then continue to a low frequency section in the middle before rising again at the end of the song. Here another example of the song of *nigra*: https://macaulaylibrary.org/asset/171543051#_ga=2.144650236.878055290.1656696475-2014444387.1650655782:

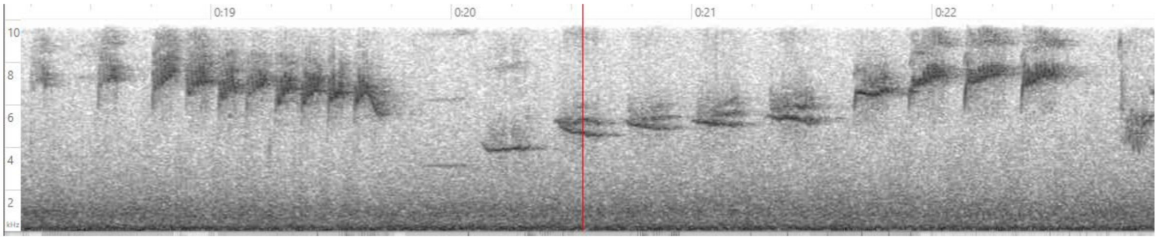


and another:
https://macaulaylibrary.org/asset/183541#_ga=2.220081360.878055290.1656696475-2014444387.1650655782

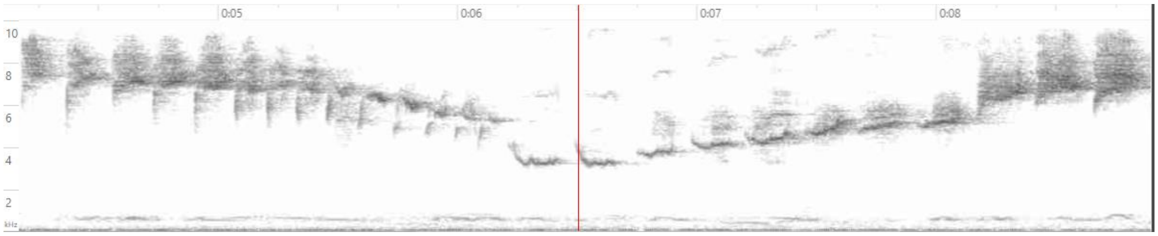


As for *taylori*, some songs resemble the example in the figure above, beginning at a lower frequency than those of *nigra*, but others begin much higher, at frequencies similar to those of *nigra*:

https://macaulaylibrary.org/asset/122665#_ga=2.211829597.878055290.1656696475-2014444387.1650655782:



and another example:
https://macaulaylibrary.org/asset/217769101#_ga=2.248390862.878055290.1656696475-2014444387.1650655782:



Other good examples of songs are at https://xeno-canto.org/574058 (Cuba) and https://xeno-canto.org/369842 (Grand Cayman).

Based on the available recordings, the songs of *taylori* appear to differ in note shape, especially in the middle and final sections of the song, and in the more steadily rising notes in the middle and final sections, which resemble to some extent the song of the Prairie Warbler *Setophaga discolor*. However, this is based on small sample sizes and is obviously not an analysis, and whether the vocal differences, if consistent, would serve as a reproductive isolating mechanism is not known.

Garrido et al. (2014) also mentioned dialects within Cuba:

> We noted slight variations in vocalisations within Cuba, as there are clearly different dialects in various regions. J. P. Sarracino (pers. comm.), a bird-fancier who has kept up to 500 bullfinches, informed OHG [Garrido] that birds from some parts of Pinar del Río province (western Cuba) possess dialects different from populations in other regions, although in AK's [Kirkconnell's] experience the song of Cuban Bullfinch at localities he has sampled in this province is typical of that elsewhere in Cuba.

Garrido et al (2014) did not specifically mention whether the birds on Isla de Juventud, 50 km from mainland Cuba, have different dialects, but the omission perhaps suggests that they are unstudied.

Much of the discussion of the previous proposal to split *taylori* (2016-A-5) centered on the vocalizations. Below are a few of the relevant comments:

Comment in favor of two species:

> Although I would agree that the morphological differences between the Cuban and Cayman populations are essentially irrelevant to species (vs. subspecies) rank, the differences in the vocalizations, as portrayed in sonograms of two individuals from each population seem dramatic, and these differences are strengthened by other quantitative comparisons (with larger N) in the text. To me, it is clear that in terms of voice, these two tanagers (yes, tanagers!) have diverged to the level associated with

> species rank in this group of birds. Of course playback experiments would provide further evidence one way or the other, but I think that those sonograms clearly place burden of proof on the single-species treatment. I cannot think of another example in the Thraupidae or related families in which taxa that divergent in song are treated as conspecific (and if there are any, we need a proposal on them).
>
> As for dismissal of song differences in oscines as merely learned rather than genetic, this oversimplification continues to plague reasoning in such decisions. Although, yes, oscines learn their song, experiments also show that they have a strong innate tendency to learn their "own" song (down to subspecies), given the choice. Thus, there is a strong genetic component to what *is* learned. Also, some features of the song *are* inherited in some species, and it is the non-inherited features that are responsible for dialect formation. Empirically, regardless of degree of learning, vocal differences are associated with species-level differences in sympatric and parapatric songs of oscines, just the way they are in suboscines and nonpasserines."

Comments in favor of a single species:

#1 "There is very little argument for reproductive isolation. Because songs in 9-primaried oscines are learned, differences in songs do not necessarily entail heritable genetic differences. Call-note vocalizations may not be learned and may argue for longer separation, but the effects on reproductive isolation are not known. Playback experiments would have been nice.

#2 "I don't see anything compelling in this proposal that would argue for species status versus continuing to recognize them as subspecies. The vocal differences are probably the most suggestive but I would like to see playback experiments as well as some genetic data before splitting these."

#3 "Song differences in birds that have substantial learned componets to their songs should be used as the basis for splits only with substantial caution."

#4 "These differences fit those of subspecies and no effort is made to compare the magnitude of these differences with closely related species to illustrate that they would likely be sufficient for reproductive isolation or assortative mating. And, as the proposal states, we do not recognize similar levels of difference as being species-level differences among other taxa with island subspecies."

We are not aware of any genetic studies involving both taxa. Burns et al. (2014) did not include a sample from Grand Cayman.

Little Cayman, Cayman Brac, and an extinct bullfinch

While researching the background, JLD ran across a mention in Garrido et al. (2014) of an extinct giant bullfinch (*Melopyrrha latirostris*) recovered as fossil remains from some of the oldest sediments on Cayman Brac. Its closest affinities are thought to be to the subspecies *taylori* of the Cuban Bullfinch (*in* Bradley 2000). Steadman and Morgan (1985) suggested that

M. latirostris probably evolved during the Plio-Pleistocene from ancestral stock, which had earlier occurred on Cayman Brac. It probably outlived its ancestral stock only to disappear during the Holocene. At what point the ancestors of *M. p. taylori* colonized Grand Cayman is unknown. Fossils of Cuban Bullfinch (*taylori*) were also found on Cayman Brac. Morgan (1994) suggested that the extirpation of *taylori* from Cayman Brac may have been due to hybridization with *latirostris.* Garrido et al. (2014 suggested that a "*Melopyrrha* fossil could also be found in Cuba but, until now, palaeontologists there have devoted their attention mainly to large birds, and the passerine paleofauna has not yet been examined."

A recent record of a Cuban Bullfinch from Little Cayman was detailed in Bradley (2000). It was recorded at Snipe Point, 29 Sept-18 Oct. 1998. Whether it was *taylori* or nominate *nigra* is not stated, and it is unclear whether it was photographed. Little Cayman and Cayman Brac are quite close to one another, the latter some 24 km farther east whereas Little Cayman is some 133 km east of Grand Cayman. This record from Little Cayman is probably equally likely to be *M. p. nigra* as *M. p. taylori.* If good photos exist, it might be identifiable to subspecies.

Both taxa of bullfinches have shown significant declines; the decline on Grand Cayman was chronicled by Bradley (2000). It had been fairly common nearly throughout Grand Cayman in the 1980s, but in the 1990s it became "very uncommon" north of George Town and throughout the West Bay Peninsula, and uncommon west of Bodden town. Garrido et al. (2014) stated that it is "now rare to absent west of Savannah due to development and loss of habitat due to forest clearance and hurricanes. It remains locally common east of Savannah." The Cuban subspecies has declined significantly due to capture in the illegal cage-bird trade. Garrido et al. (2014) detailed this and wrote that this species

> has long been a favoured target of Cuban 'pájereros' (bird trappers) and Barbour (1943) already suggested it had been trapped excessively. Most harvested birds are males, because non-singing females are released. Captive males are often used in local singing competitions. It is also one of the birds most frequently smuggled out of Cuba to meet international demand for cage birds, especially to Miami, Florida (Garrido & Kirkconnell 2000). Harvesting for the cage bird trade has resulted in a dramatic decline of populations in many areas where the species was formerly common.

JLD has noted a significant decline just in 15 years of visiting Cuba (ten trips). Note that we (AOU 1998) mentioned that sightings from South Florida "were probably escapes from captivity (Robertson and Woolfenden 1992)."

Recommendation

JLD feels the case for re-splitting the bullfinches is not a clear-cut decision, but in this case when considering previous taxonomic treatments, notably separate species status from 1896 to 1938 (including by Hartert and Bond), prior to Hellmayr (1938), one should examine the rationale for the lump. Because Hellmayr (1938) supplied no rationale other than "clearly a subspecies," why consider it a controlling decision deserving precedent and requiring significant evidence for a reversal? Moreover, the rationale for the split of St. Kitts Bullfinch *Melopyrrha* *grandis* in the 62nd Supplement (Chesser et al. 2021) should also be applied to this case: “Formerly considered conspecific with *M. portoricensis,* but separated based on morphological differences (Garrido and Wiley 2003) commensurate with those between other species in *Melopyrrha.*” JLD feels that the split of Barbados Bullfinch (*Loxigilla barbadensis*) in a related genus from *L. noctis* (Banks et al. 2006) would also fit into this mode, in which the evidence has pros and cons for a split. In the two previous cases and in this case, the rationale for splitting seems roughly comparable, although each, of course, presents its own series of competing issues. If these two bullfinches are split we suggest the English names of Cuban Bullfinch (*Melopyrrha nigra*) and Grand Cayman Bullfinch (*Melopyrrha taylori*), following Ridgway (1901).

RTC has gone back and forth on this borderline case, but at this point has a slight preference for retaining *taylori* as a subspecies of *M. nigra.* The morphological differences could be interpreted as indicative of either species or subspecies, but are probably more appropriate for subspecies: the taxa differ mainly in bill depth and plumage color, with males of *nigra* being more glossy than those of *taylori*, and females being dull black rather than slaty gray. Although NACC may have elevated the extinct *M. grandis* on morphological grounds, the evidence for this wasn’t overwhelming, either, and it was argued that the differences in a variety of linear measurements in *grandis* would likely have been tied to sizeable differences in body mass (no data on body mass being available for *grandis*), which we know is not the case for *nigra* and *taylori*, which differ by ca. 1.5 grams. It was also suggested that there had been strong habitat differences between *grandis* and *portoricensis*. The vocal differences between *nigra* and *taylori* in Garrido et al. (2014), which seemed to convince those voting YES in 2016, actually show a large amount of overlap; although other vocal differences may be present, sample sizes are small and the functional significance of any differences is not known. Finally, the case for elevating *Loxigilla barbadensis* to species rank seems very different and much stronger than that for elevating *M. taylori*, principally because of the night-and-day difference in male plumage of *L. barbadensis* vs. that of *L. noctis*: males of *noctis* are black with orange throats, whereas males of *barbadensis* are dull brown and look like the females of both *barbadensis* and *noctis*. The radically different male plumage of *barbadensis* vs. *noctis* seems much more likely to confer reproductive isolation that the somewhat different female plumage (or slightly different male plumage) of *taylori*.

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Submitted by: Jon L. Dunn and R. Terry Chesser

Date of Proposal: 2 July 2022

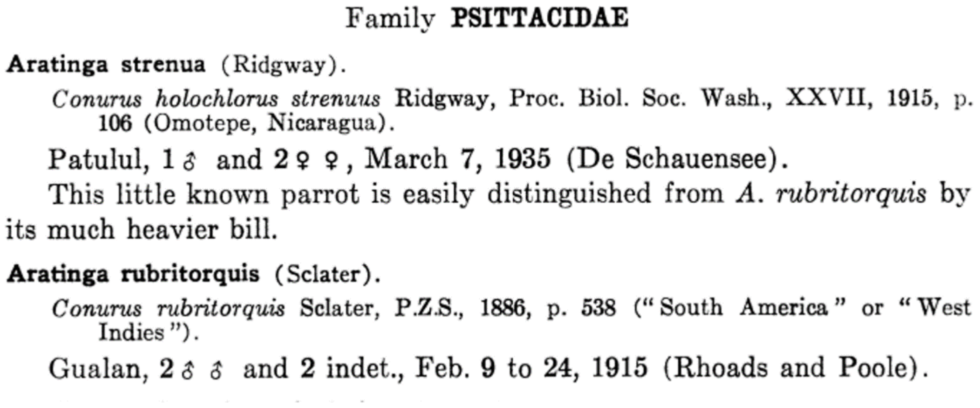
Revise the taxonomy of Green Parakeet *Psittacara holochlorus*: (a) split Red-throated Parakeet *P. rubritorquis* from *P. holochlorus*, (b) lump Pacific Parakeet *P. strenuus* with *P. holochlorus*, and (c) reconsider the split of Socorro Parakeet *P. brevipes*

Note: This proposal includes elements of Proposal 2019-B-6 to split *P. brevipes* (which passed). This version of this proposal has been amended to include newly available data from Smith et al. (2022) and information from Komar (2021).

Description of the problem:

Parakeets of the recently circumscribed (Remsen et al. 2013) genus *Psittacara* Vigors, 1825, are primarily green, some with red accents mainly on the forehead, and their taxonomy is (not surprisingly) contentious. The Green Parakeet *Psittacara holochlorus* (Sclater, 1859) of Mesoamerica has long been considered to include the all-green "Socorro Parakeet" *P. h. brevipes* (Lawrence, 1871) and the strikingly plumaged "Red-throated Parakeet" *P. h. rubritorquis* (Sclater, 1887), along with *P. h. brewsteri* (Nelson, 1928) of northwestern Mexico, the latter evidently very similar to the nominate (e.g., Sibley and Monroe 1993). Wolters (1975) included *strenuus* along with these taxa in *holochlorus*.

Specific status has been recommended for both *brevipes* and *rubritorquis*, for example, by Ridgway (1916), Howell and Webb (1995, although ambiguously for the latter taxon) and Collar (1997). Collar et al. (2014, 2018), however, considered only *rubritorquis* specifically distinct (without specifically invoking the Tobias et al. criteria) and lumped *strenuus* with *holochlorus*. AOU (1998) recognized three groups: *holochlorus*, *brevipes*, and *rubritorquis*, but AOS now considers *brevipes* of Socorro Island specifically distinct (Proposal 2019-B-6; Chesser et al. 2019). AOU (1998) recognized the all-green Pacific Parakeet *Psittacara strenuus* as distinct, although it is sometimes considered a subspecies of *P. holochlorus* (e.g., Land 1970, Wolters 1975, Collar et al. 2018); it differs from *P. holochlorus* in being notably larger, particularly in bill and feet (Ridgway 1916), and in its whitish vs. dark purplish orbital skin (not clear from the literature but obvious in many photos, as independently noted by Komar 2021). Carriker and Meyer de Schauensee (1935) treated both *strenuus* and *rubritorquis* as specifically distinct from *holochlorus* (see below):



Family **PSITTACIDAE**

Aratinga strenua (Ridgway).

Conurus holochlorus strenuus Ridgway, Proc. Biol. Soc. Wash., XXVII, 1915, p. 106 (Omotepe, Nicaragua).

Patulul, 1 ♂ and 2 ♀ ♀, March 7, 1935 (De Schauensee).

This little known parrot is easily distinguished from *A. rubritorquis* by its much heavier bill.

Aratinga rubritorquis (Sclater).

Conurus rubritorquis Sclater, P.Z.S., 1886, p. 538 ("South America" or "West Indies").

Gualan, 2 ♂ ♂ and 2 indet., Feb. 9 to 24, 1915 (Rhoads and Poole).

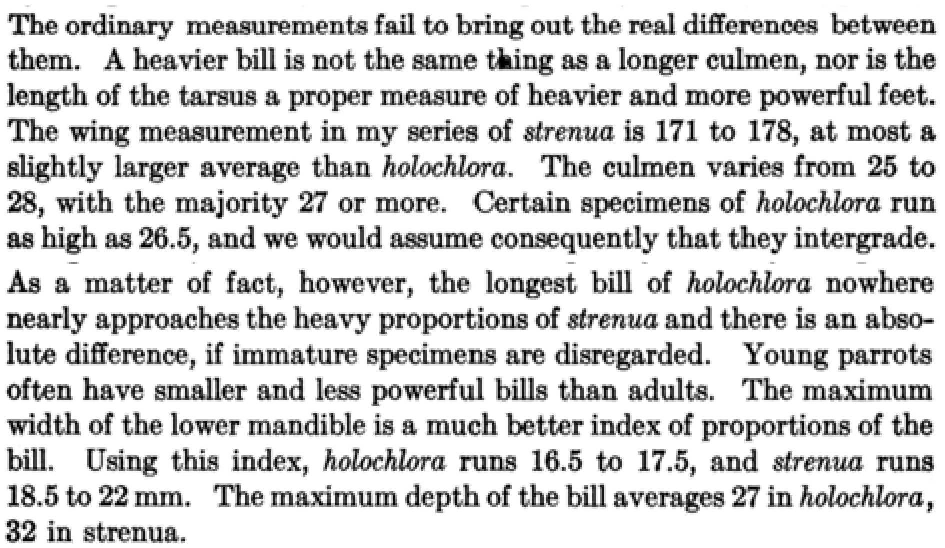
Blake (1953) considered *brewsteri* and *holochlorus* to be birds of hills and mountains, although he stated that *strenuus* (which he treated as conspecific with *holochlorus*) occurs in the Pacific lowlands of Oaxaca and Chiapas. Land (1970) remarked that "[t]he two subspecies of the Green Parakeet in Guatemala are quite distinct and have often been considered to be separate species", although he retained both *strenuus* and *rubritorquis* within *holochlorus* and did not distinguish between either their elevational or habitat preferences. Monroe (1968) gave the following arguments for his treatment of *rubritorquis* as conspecific with *holochlorus* and for *strenuus* as a separate species:

> After examination of a series of specimens from Mexico, Guatemala, and Honduras, I agree with the current treatment of the Red-throated Parakeet, *A. h. rubritorquis* (Sclater), as a subspecies of *A. holochlora* of Mexico. The amount and extent of orange feathering on the throat varies greatly, both with age and individually, and there is a general tendency towards an increased amount of orange in birds from the southern part of the range. Many individuals possess only a few feathers of this color on the throat, these feathers often being arranged asymmetrically. I have even seen apparently adult individuals from Honduras that lacked the orange altogether. In habits and ecology, both *rubritorquis* and *holochlora* are similar in the areas of southern Mexico and Guatemala where the two races approach one another geographically.

With regard to *strenuus*, Monroe (1968) stated:

> The species is primarily a bird of the arid lowlands of the Pacific slope from Oaxaca to Nicaragua but ranges up to 1,350 meters in El Salvador and to 2,100 meters in Guatemala. In Honduras it is probably an uncommon resident of the lowlands of the Pacific coast. … This parakeet has sometimes been considered conspecific with *A. holochlora*, primarily on the basis of the entirely green coloration…*A. strenua* is specifically distinct from *holochlora*, having a much heavier bill and stouter feet, as well as occurring sympatrically with the latter in certain localities. Furthermore, there seems to be no intergradation in size with respect to certain bill measurements.

Davis (1972) considered both *strenuus* and *rubritorquis* specifically distinct (although without his usual reliance on vocalizations), stating that *strenuus* is "[s]imilar to last-named species [*holochlorus*] but much larger and with relatively larger bill and feet; also ecologically different" and gave its range as "Pacific lowlands from s.w. Mexico (Oaxaca) to Nicaragua." Forshaw (1973), who included all forms within *A. holochlora*, summarized much of the above but concluded: "I have found intergradation between *holochlora* and *strenua* in all measurements, including bill width, so in my opinion *strenua* is nothing more than a poorly-differentiated race. If, as has been predicted, *strenua* and *rubritorquis* are found to be sympatric in Guatemala then it is *rubritorquis* that should be considered a separate species." However, the measurements presented by Forshaw (1973) do not include bill width, and those that are presented show minimal overlap. In fact, Griscom (1932) had much earlier summarized this issue thus:



> The ordinary measurements fail to bring out the real differences between them. A heavier bill is not the same thing as a longer culmen, nor is the length of the tarsus a proper measure of heavier and more powerful feet. The wing measurement in my series of *strenua* is 171 to 178, at most a slightly larger average than *holochlora*. The culmen varies from 25 to 28, with the majority 27 or more. Certain specimens of *holochlora* run as high as 26.5, and we would assume consequently that they intergrade. As a matter of fact, however, the longest bill of *holochlora* nowhere nearly approaches the heavy proportions of *strenua* and there is an absolute difference, if immature specimens are disregarded. Young parrots often have smaller and less powerful bills than adults. The maximum width of the lower mandible is a much better index of proportions of the bill. Using this index, *holochlora* runs 16.5 to 17.5, and *strenua* runs 18.5 to 22 mm. The maximum depth of the bill averages 27 in *holochlora*, 32 in strenua.

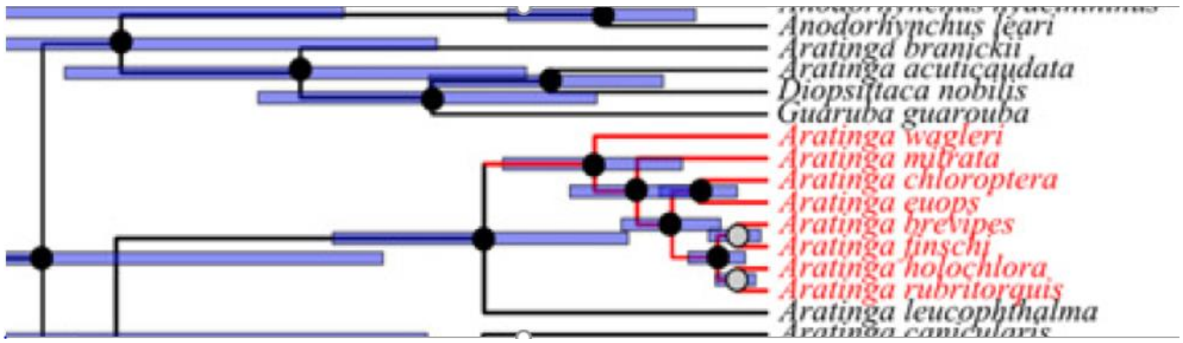
The AOU/AOS has long treated *strenuus* as a full species, as did, e.g., Peters (1937), Edwards (1974), Sibley and Monroe (1993), and Dickinson and Remsen (2013), based on *holochlorus* and *strenuus* both having been collected at Tapanatepec, Oaxaca, in September 1927, which has been interpreted as indicating sympatry (Bangs & Peters 1928). This evidence of sympatry was understandably considered weak by Howell and Webb (1995), Juniper and Parr (1998) and Collar et al. (2018), the latter two therefore justifying treatment of *strenuus* as a subspecies of *holochlorus*. AOU (1998) maintained that “differences are retained in areas of close approach”, implying at least parapatry if not sympatry of *holochlorus* and *strenuus*, and *strenuus* continues to be recognized as a species (Chesser et al. 2022).

Navarro-Sigüenza and Peterson (2004) considered *brevipes, brewsteri*, and *rubritorquis* to be evolutionary species. Forshaw (2006) revised his views from his 1973 book, recognizing *brevipes*, *strenuus*, and *rubritorquis* as specifically distinct from *holochlorus*. He didn’t provide rationale for most of these taxonomic changes, but he did note that *strenuus* and *rubritorquis* differ in behavior where they occur together in mixed roosting flocks in El Salvador. He also cited Howell and Webb (1995) for vocal descriptions and specifically for differences in calls between *brevipes* and *holochlorus* and between *strenuus* and *rubritorquis*. Gill and Donsker (2018 and other versions) also treated *brevipes*, *strenuus*, and *rubritorquis* as distinct species.

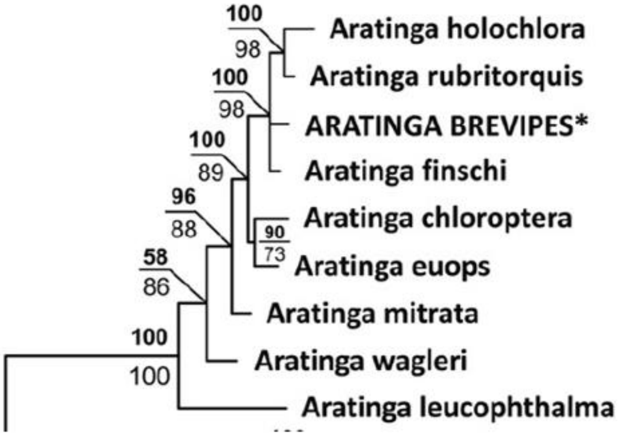
New information:

Komar (2021) summarized some of the historical treatments and identification problems surrounding Mesoamerican *Psittacara*, and conducted an analysis of certain aspects of morphological characteristics and breeding biology evident from ML photographs (summarized below), but did not address genetics or vocalizations.

mtDNA.—Multiple recent studies have included mtDNA samples of *rubritorquis* in phylogenies, all showing shallow divergence between *rubritorquis* and *holochlorus* (the latter not including *brevipes*). Until very recently, *strenuus* had not been sampled genetically.



Relevant part of Fig. 1 of Schweizer et al. (2014), using mtDNA sequences from GenBank.



Relevant part of Fig. 1 of Urantowka et al. (2014), using ND2.

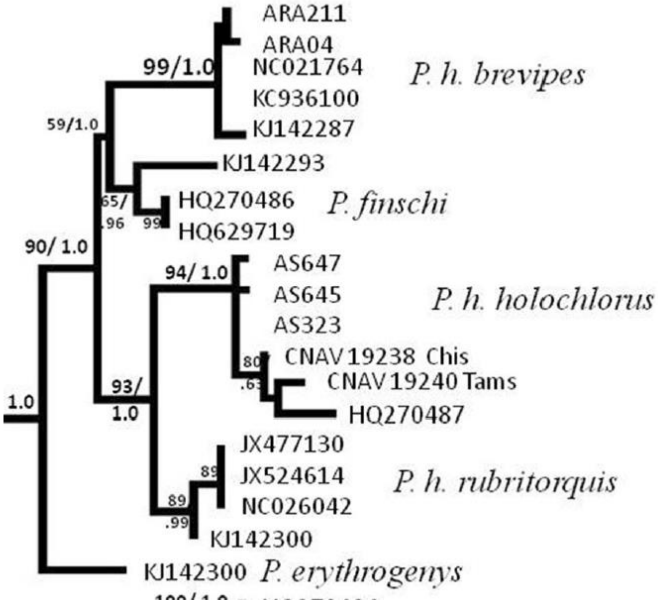


Fig. 2 of Martínez-Gómez et al. (2017); ND2.

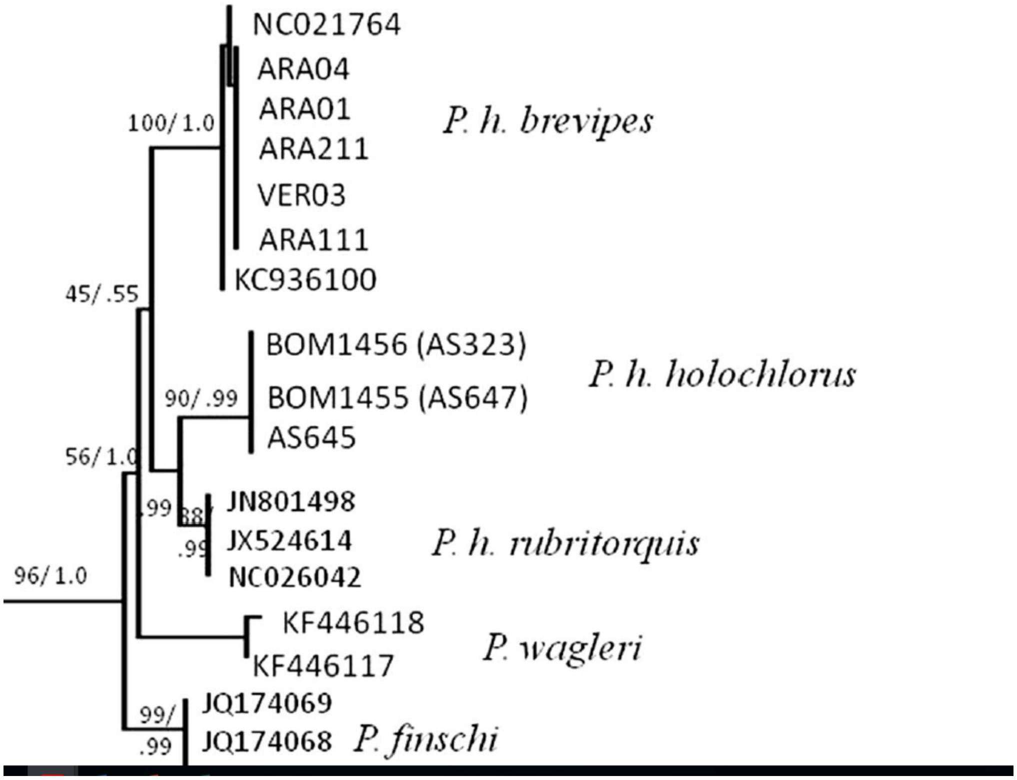
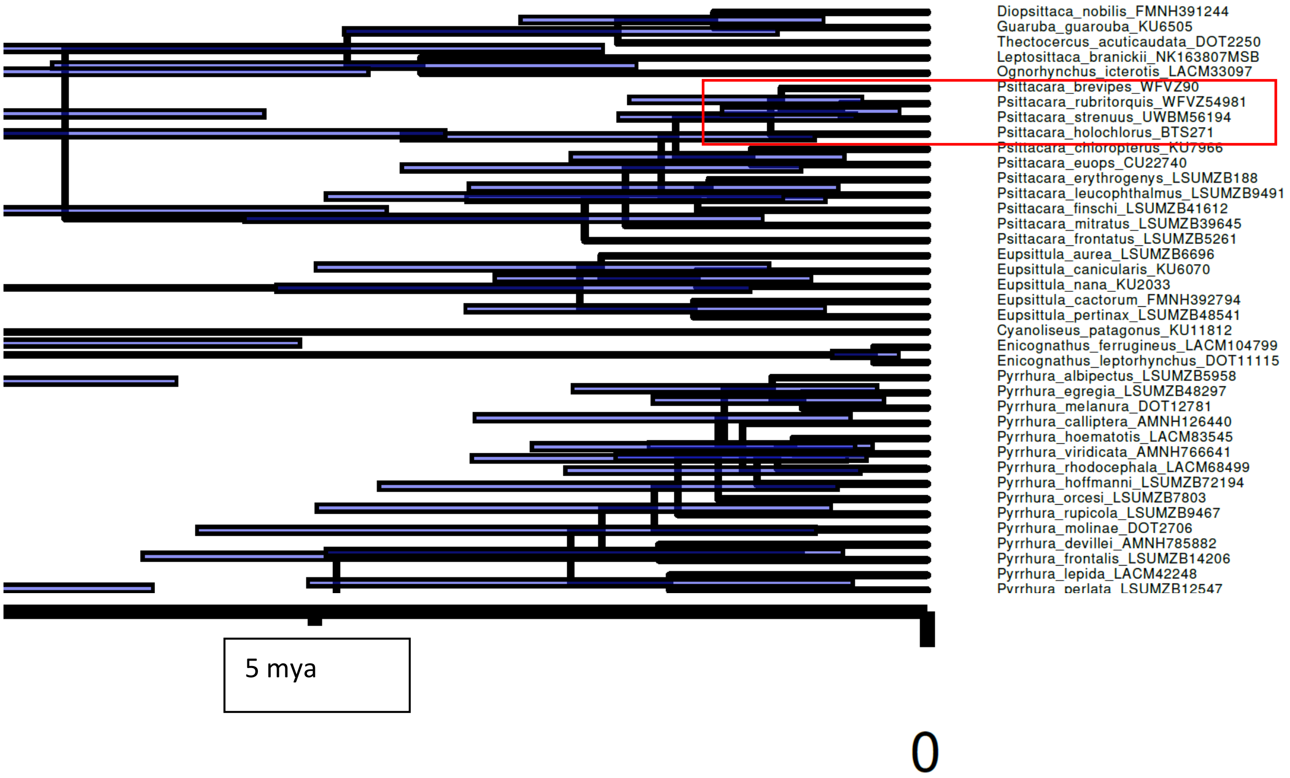


Fig. 3 of Martínez-Gómez et al. (2017), COI.

Urantowka et al. (2015) also characterized the mitogenome of *rubritorquis* “for future examination of evolutionary diversification of the *P. holochlora* group”, and compared it with that of *brevipes*, not surprisingly finding them to be similar overall, with differences limited to “ND5/CYTB – intergenic seguence [sic], control region and 16S rRNA gene; … corresponding ND6 genes require different start codons: ATG for *P. rubritorquis* and ATA for *P. brevipes*.”

After an earlier version of this proposal was written, Smith et al. (2022) became available, and for the first time *strenuus* was included in a molecular phylogeny, this one based on UCE data. According to these data, *strenuus* and *rubritorquis* are sisters, with *brevipes* sister to that clade and *holochlorus* sister to these. Thus, the paraphyly shown in the mtDNA trees disappears in the UCE tree. The Smith et al. UCE study, which covers the whole of Psittaciformes, is based on single individuals for each of these taxa. Branch lengths are comparable to those between several other recognized species of *Psittacara*, as well as many other species pairs or complexes in other genera, and much greater than a few such as the two universally recognized and broadly sympatric species of *Enicognathus*. The UCE phylogeny, showing *holochlorus* as sister to all the other members of the clade, and *strenuus* and *rubritorquis* as close sisters, may appear to provide support for specific status for *rubritorquis* and to Komar’s (2021) suggestion that there is no evidence for considering *rubritorquis* as a subspecies of *holochlorus*. However, being based on single representatives of each taxon, such an interpretation may be premature.



Screenshot of relevant portion of Smith et al. (2022) time-calibrated tree from their Figure S27.

Voice.—There are several sound recordings of both *holochlorus/brewsteri* and *rubritorquis* on xeno-canto and Macaulay Library, but they are variable as expected and do not obviously differ in any consistent way. Recordings of *strenuus* typically sound lower-pitched, as noted by Howell and Webb (1995) and Vallely and Dyer (2018), as one might expect for a bigger bird. However, Howell and Webb (1995) noted for *holochlorus* that "Flight calls of Chis birds lower than NE Mexico, call structure apparently more like flight calls of Pacific Parakeet (SNGH tape, sonograms) than of Green Parakeets in NE Mexico." Vocal analysis is needed to clarify these issues.

Morphology.—In a PCA of four morphological traits, Martínez-Gómez et al. (2017; see their Fig. 4 below) found that *rubritorquis* shares morphospace with some *holochlorus* (circles) and *brewsteri* (triangles), but not *strenuus* (+ signs) or *brevipes* (squares).

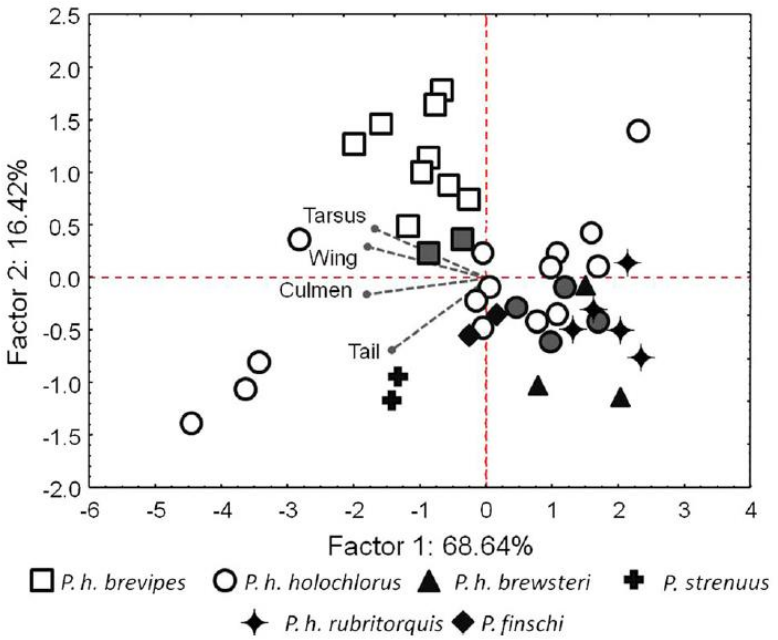


Fig. 4 Principal component analysis of four morphological traits of *Psittacara* species. *Gray* and *black* symbols represent scores derived from grand mean values reported by Ridgway (1916) and Nelson (1928)

Komar (2021) showed that orbital skin color (as determined from photographs) differs fairly consistently between the dark color of *holochlorus* and mostly pale color of *strenuus*, but with overlap in Guatemala, while *rubritorquis* consistently has dark gray orbital skin.

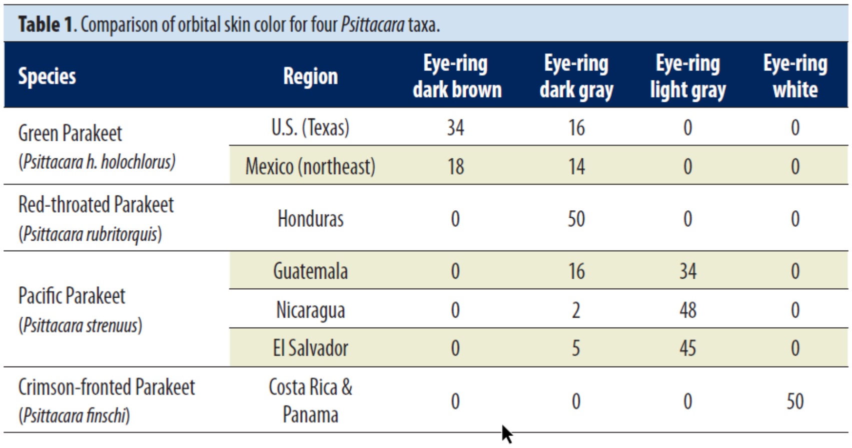


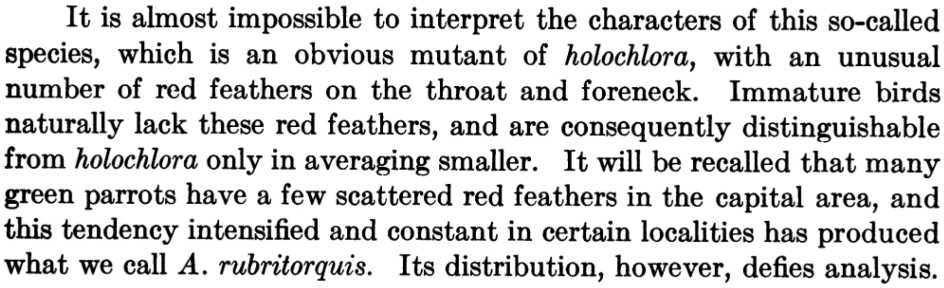
Table 1. Comparison of orbital skin color for four *Psittacara* taxa.

Species	Region	Eye-ring dark brown	Eye-ring dark gray	Eye-ring light gray	Eye-ring white
Green Parakeet (*Psittacara h. holochlorus*)	U.S. (Texas)	34	16	0	0
	Mexico (northeast)	18	14	0	0
Red-throated Parakeet (*Psittacara rubritorquis*)	Honduras	0	50	0	0
Pacific Parakeet (*Psittacara strenuus*)	Guatemala	0	16	34	0
	Nicaragua	0	2	48	0
	El Salvador	0	5	45	0
Crimson-fronted Parakeet (*Psittacara finschi*)	Costa Rica & Panama	0	0	0	50

Table 1 from Komar (2021).

The red throat is typically extensive and very noticeable in adult *rubritorquis*, while being absent or just a few scattered red feathers (often around the head instead of the throat and breast) in *holochlorus* and *strenuus*. However, some *rubritorquis* (in which age is usually difficult to discern from photos) completely lack the red patch or have a smaller, asymmetric patch, as apparent from eBird photos from throughout the range of *rubritorquis* (although several of these turned out to be likely misidentified Pacific Parakeets *P. strenuus*; these differ most conspicuously in their whitish vs. dark orbital skin (as also noted by Komar 2021) and relatively large bill). eBird photos from northwestern Guatemala show at least one bird with a rather small, paler orange mid-breast patch (e.g., https://ebird.org/camerica/checklist/S37850213) and others that are unassignable, although there appears to be a geographic break in most of Guatemala largely isolating *rubritorquis* from *holochlorus*.

This aligns with Griscom's (1932) specimen-based observations:



> It is almost impossible to interpret the characters of this so-called species, which is an obvious mutant of *holochlora*, with an unusual number of red feathers on the throat and foreneck. Immature birds naturally lack these red feathers, and are consequently distinguishable from *holochlora* only in averaging smaller. It will be recalled that many green parrots have a few scattered red feathers in the capital area, and this tendency intensified and constant in certain localities has produced what we call *A. rubritorquis*. Its distribution, however, defies analysis.

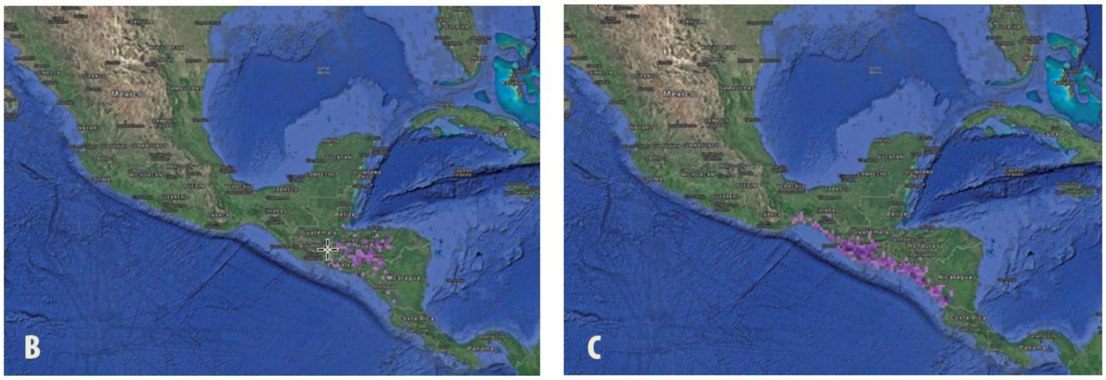
Surprisingly, in the first recorded captive U.S. breeding of *rubritorquis*, Noegel (1986) stated that "[T]hese three chicks developed the red on their throats immediately and did not go through the first year with green throats as the imported young." The same author stated that orange throat patches in this taxon are due to improper diets in captivity and that the patch soon becomes red again with proper nutrition (Noegel 1986). However, several photos of presumably wild individuals on eBird also show more orange than red throats, in some cases patchy orange and red, the latter suggesting wear or fading.

Komar (2021) examined the distribution of red flecking in detail in members of this complex and found no obvious differences in amount or frequency between *holochlorus* and *strenuus*, although the latter more often had the flecks around the throat area.

My brief examination of USNM specimens reinforced to me that the shape and size differences between these taxa are not readily dismissed as intraspecific variation, given the rather subtle differences between many species in this group. Here are a few photos from the USNM collection that show the differences in head size and bill size between *holochlorus* (left in each) and *brevipes* (right in each):

and between *strenuus* (left in each) and *rubritorquis* (right in each):

Evidence for Sympatry.—Komar (2021) stated "I provide evidence below of breeding sympatry [of *rubritorquis* and *strenuus*] in Tegucigalpa", although the only such evidence to be found subsequently in the article is a parenthetical statement that they are sympatric during the breeding season in Tegucigalpa, and year-round eBird maps showing overlap in western Honduras.



eBird maps of reports of (B) *rubritorquis* and (C) *strenuus* (from Komar 2021).

Conversely, a mixed pair of *strenuus* and *rubritorquis* in Tegucigalpa, west-central Honduras was documented and discussed by Komar (2021). (However, it should be noted that this may be the only known case of hybridization between these two taxa.)


PSITTACARA PARAKEETS IN MEXICO AND CENTRAL AMERICA

Figure 2. A mixed pair of Red-throated Parakeet (darker gray orbital skin) and Pacific Parakeet (lighter gray orbital skin) scouting a potential nesting site (LOWER LEFT) and an apparent offspring that accompanied them (UPPER LEFT). Note differences in orbital skin color, with the offspring showing a gray shade intermediate of the two adults. Photographed 19 Mar 2021, this family group is part of an apparently wild flock of approximately 25 Pacific Parakeets and one Red-throated Parakeet that was reported frequently in Tegucigalpa in 2019, 2020, and 2021. *Photos © Oliver Komar.*

images, until I had collected morphological data from 50 individual birds, taking care not to consider duplicates (photos of the same bird), photos that were clearly or possibly misidentified, or photos in which the characteristic could not be seen clearly (for example, poor photo quality or the position of the bird).

To avoid identification problems for very similar species, I restricted selections of reference photos to core ranges, far from range overlap: for Green Parakeet, only northeast Mexico and Texas; for Red-throated Parakeet, only Honduras, excluding Choluteca Dpt, Valle Dpt, and the metropolitan area of Tegucigalpa where there is overlap with Pacific; for Pacific Parakeet, only

brown or dark gray. Photos of nominate Green Parakeets showed mostly (63%) dark brown orbital skin, while 37% had dark gray orbital skin (Table 1). The two shades were not very different and some of the classifications may have been due to lighting effects and less to true variation.

Red-throated Parakeets have a similar eye-ring color when compared to many nominate Green Parakeets, although with less variabil-

P. 21 (part) from Komar (2021).

From the above, clearly there is at least limited hybridization and gene flow between *rubritorquis* and *strenuus* (although of course parrots in mixed roosts or in isolation from members of their species will take up with parrots of other species).

There is also the issue of the identity of populations of southern Mexico and Guatemala, which Komar (2021) states are often inadequately identified. The intermediacy of orbital skin color of *strenuus* in Guatemala and the confusion over what exactly occurs in southern Mexico (Komar 2021) could suggest clinal variation. Komar (2021) found that a presumably well-known limestone sinkhole-breeding colony in northwest Chiapas conventionally attributed to *holochlorus* actually seems to pertain to *strenuus*, based on his examination of eBird photographs, which did not include any obvious *holochlorus* from the site.

Ecology and behavior.—The habitat of *rubritorquis* is primarily semiarid to semideciduous forest, especially pine forest (and towns, judging from photos) of the hills and mountains at least during the breeding season, although *strenuus* (if that's what it is; there is reason for doubt) also occurs from deciduous forest, riparian and mangrove habitats in lowlands to, at least occasionally, pine-oak highlands in Guatemala (Howell and Webb 1995, Wermundsen 1997, Monterrubio-Rico et al. 2016, Komar 2021), and also occurs at least seasonally in the arid interior Rio Motagua Valley on the Atlantic slope of Guatemala (Land 1962, Eisermann and Avendaño 2018). In the Motagua Valley, *rubritorquis* occurs in the pine forests that form the transition between the arid lowlands and the humid forest (Griscom 1932).

Thurber et al. (1987) documented a mixed roost of *strenuus* and *rubritorquis* in a coffee plantation in San Salvador, El Salvador, in the 1970s, stating "We noted behavioral differences between the forms. The red-throats separated themselves from the greens while perching and flying, although solitary red-throats occasionally joined groups of greens. The red-throats frequently perched in the tops of leafless trees, whereas greens were almost always in dense foliage. Red-throats tended to remain later in the morning before leaving to feed. The greens bred in a large colony at Los Chorros and a small colony in the Department of la Union, where they nested in cavities in vertical rock faces. We never saw red-throats in either of these colonies, and do not know if they breed at all in El Salvador. Our limited observations suggest that red-throats migrate or wander into El Salvador during the dry season, mingling with but not truly joining with the resident greens."

Komar's (2021) analysis of photographic evidence and personal observations suggests a marked difference in nesting site preferences between *holochlorus* and *strenuus*, with the former nesting mostly singly in tree cavities and the latter colonially in rock wall cavities or buildings. Practically nothing seems to be known of nesting of *rubritorquis*, however.

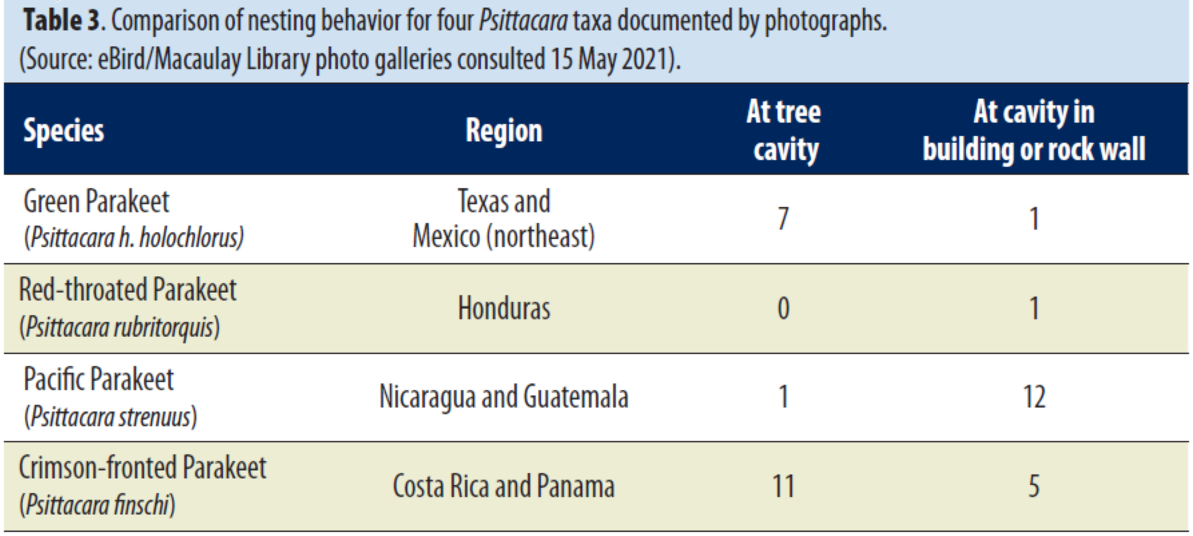


Table 3. Comparison of nesting behavior for four *Psittacara* taxa documented by photographs. (Source: eBird/Macaulay Library photo galleries consulted 15 May 2021).

Species	Region	At tree cavity	At cavity in building or rock wall
Green Parakeet (*Psittacara h. holochlorus*)	Texas and Mexico (northeast)	7	1
Red-throated Parakeet (*Psittacara rubritorquis*)	Honduras	0	1
Pacific Parakeet (*Psittacara strenuus*)	Nicaragua and Guatemala	1	12
Crimson-fronted Parakeet (*Psittacara finschi*)	Costa Rica and Panama	11	5

Table 3 from Komar (2021)

Effect on AOS-CLC area:

There are three parts to this proposal. First, if (a) the proposal to split *rubritorquis* passes, the AOS would recognize an additional species of *Psittacara*, endemic to northern Central America. We would need to prepare a new species account for *rubritorquis* and modify the existing account for *holochlorus*. Second, if (b) the proposal to lump *strenuus* passes, we would need to remove that account and modify the existing account for *holochlorus* accordingly. Third, if (c) the vote is to lump *brevipes*, we would need to remove that account and modify all accordingly.

Recommendation:

With this complex, there are multiple issues that should be borne in mind, including branch lengths similar to those of several other *Psittacara* species and species in other genera of parrots; the lack of a thorough genetic study with multiple individuals of all taxa; and the striking differences in bill and head size in adjacent populations that nevertheless appear to interbreed to an unknown extent. The Smith et al. team have indicated they are working on a taxonomic paper based on Smith et al. (2022), so it may be best to await this, if not a more densely sampled study, before making changes.

a) I do not recommend treatment of *P. rubritorquis* as a species at this time, based on the data showing a close sister taxon relationship either with *P. holochlorus* (based on mtDNA) or with *strenuus* (based on UCE data); the inconsistency of presence, size, and shape of the red throat patch (although it is typically strikingly different); apparent intermediacy in western Guatemala (Vallely and Dyer 2018) and an apparent hybrid pair in Honduras (Komar 2021); and a lack of obvious vocal differences. Specific treatment might well be warranted, but the UCE data suggest conspecificity with *strenuus* rather than *holochlorus* (although these forms differ most in morphology), and further study is needed rather than upending a long-standing treatment on the basis of conflicting data.

(b) I also do not recommend lumping *strenuus* with *holochlorus* at this time. The extent of hybridization with *holochlorus* and *rubritorquis* remains unclear and may be minimal; they appear to be largely ecologically separated by habitat, elevation, nesting site, and tendency to coloniality; some behavioral differences from *rubritorquis* have been noted; and *strenuus* has a somewhat deeper voice (at least than *holochlorus* in NE Mexico). There is a huge knowledge gap in southern Mexico and northern Guatemala as to which form(s) occur that remains to be investigated and clarified. The UCE data (based on single individuals of each) also would suggest caution in uniting *strenuus* with *holochlorus*. Although *strenuus* may indeed warrant lumping with *holochlorus*, again in my opinion further study is needed before this step is taken.

(c) Finally, I do not recommend lumping *brevipes* at this time. Though the UCE data contradict the mtDNA data that indicated paraphyly, Proposal 2019-B-6 (https://americanornithology.org/nacc/current-prior-proposals/2019-proposals/) summarizes the morphological and vocal differences of this allopatric taxon, and again branch lengths are fairly typical of species within *Psittacara* and in other genera.

Please vote on whether to: (a) split *rubritorquis*; (b) lump *strenuus*; and (c) lump *brevipes*.

If *rubritorquis* is split, the existing English name Red-throated Parakeet seems suitable, familiar, and uncontroversial. The name Orange-throated Conure has been used in the avicultural community but is said to be based on birds receiving poor nutrition (Noegel 1986), and in any case does not reflect the usual throat coloration.

If *strenuus* is lumped, retention of the name Green Parakeet becomes problematic under our guidelines, as the range of *holochlorus sensu stricto* is not greatly larger than that of *strenuus*. However, it may still be the best solution as Green Parakeet has been used elsewhere when *strenuus* is included in the expanded species. I recommend dealing with this if the situation arises.

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Submitted by: Pamela C. Rasmussen, Michigan State University

Date of proposal: 22 July 2022, revised 4 September 2022 and 14 January 2023

Treat *Eupsittula astec* as a separate species from Olive-throated Parakeet *E. nana*

Background:

The genus *Eupsittula* as currently recognized is comprised of five species of medium-sized green parakeets that vary primarily in the amounts of brownish-olive on the underparts and red/orange on the face. They are distributed from Mexico south through Central America and South America to Bolivia and extreme northern Argentina, with *Eupsittula nana* also occurring on Jamaica. While currently recognized as a single species by most global checklists, including the AOS Check-List, *E. nana* historically was often considered two separate species, with *E. nana sensu stricto* restricted to Jamaica, and *E. astec* occurring in eastern Mexico and Central America from central Tamaulipas to western Panama.

Eupsittula nana was described in 1830 by Vigors (1830) as *Psittacara nana*. *Eupsittula astec* was described as a separate species in 1857 by Souancé (1857), as *Conurus astec*. In distinguishing it from *nana*, Souancé (1857) noted the following about *nana*: its longer tail, its darker coloration, its larger and entirely white bill, and the entirely bare cere. The two taxa were considered as distinct species by most subsequent authors, including Ridgway (1916), who also noted that *nana* had a much larger and relatively deeper bill than all other members of the genus *Eupsittula*, although he did also note its plumage was very similar in coloration to that of *astec*. In the *Catalogue of Birds of the Americas*, Cory (1918) considered the two separate species, as did Peters (1937) and Friedmann et al. (1950).

Bond (1945) was the first to mention that the two might better be considered as conspecific (although he did still maintain them as separate in this publication). Following Bond (1945), Marien and Koopman (1951) also believed that the two are probably better treated as conspecific using a yardstick assessment and comparing them to other parakeets (although again they did not explicitly lump or split the two). They noted that *nana* and *astec* are more alike to each other than sympatric members of what they called the subgenus *Eupsittula*, and that there is more variation within some species (e.g., *Aratinga auricapillus*) than there is between *nana* and *astec*. It is worth noting, however, that most of their comparisons were between members of what is now recognized as *Aratinga*, or even between a member of *Eupsittula* and *Aratinga* (e.g., comparisons between *E. pertinax* and *A. solstitialis*, or within *A. auricapillus*), so these comparisons may not be particularly relevant given what we now know about relationships among these parakeets (see phylogeny in Provost et al. 2018). Marien and Koopman (1951) mentioned that *nana* is larger than *astec*, and that *nana* usually lacks the yellow feathering around the cere that is present in *astec*, although some birds can show some yellow feathering. Forshaw (1973) was the first author to definitively lump the two, although Parkes (1976) continued to treat *astec* as a distinct species in his discussion of the taxon *E. astec melloni* (Twomey, 1950). The sixth edition of the AOU *Check-list* listed the two taxa as conspecific (AOU 1983), and most global checklists have followed this approach, including Clements (Clements et al. 2021), Howard and Moore (Dickinson and Remsen 2013), and IOC (Gill et al. 2022). The Handbook of Birds of the World and BirdLife International, using the scoring methodology for species delimitation of Tobias et al. (2010), split the two taxa. Using that scoring system, the following differences were assessed: "[*nana*] differs in its darker, browner breast and lower underparts (2); darker (royal- *vs* turquoise- = 1) and much more extensive (= 1) blue with broader black fringes (= 1) in flight-feathers (total = 3); larger size, with effect size on bill 6.91 and on tail 3.97 (score 3)" (Collar et al. 2020). Howell and Webb (1995) also treated the two taxa as separate species, although they did not provide any comment on the split.

Vocally, the two seem very similar. Collar et al. (2020) mentioned that there are no described differences between *nana* and *astec*. There appear to be no other mentions of vocal differences (or lack thereof) in other publications. In listening to a small selection of recordings in Macaulay Library, the two do possibly seem different, with *astec* seemingly sounding slightly higher pitched and faster than *nana* to my ear. Below are some example recordings of the two:

nana: https://macaulaylibrary.org/asset/358958021, https://macaulaylibrary.org/asset/164604

astec: https://macaulaylibrary.org/asset/82419181, https://macaulaylibrary.org/asset/103345

New Information

The only relatively new information since these taxa were treated as a single species by the AOU (1983) is a study on the phylogeography of *E. nana* to understand the nature of a population on Hispaniola (Latta et al. 2010). Using mtDNA sequence data, Latta et al. (2010) found that *nana* and *astec* had 1.73-1.88% sequence divergence and were reciprocally monophyletic (see tree below). Birds from Hispaniola were included in the *nana* clade, and did

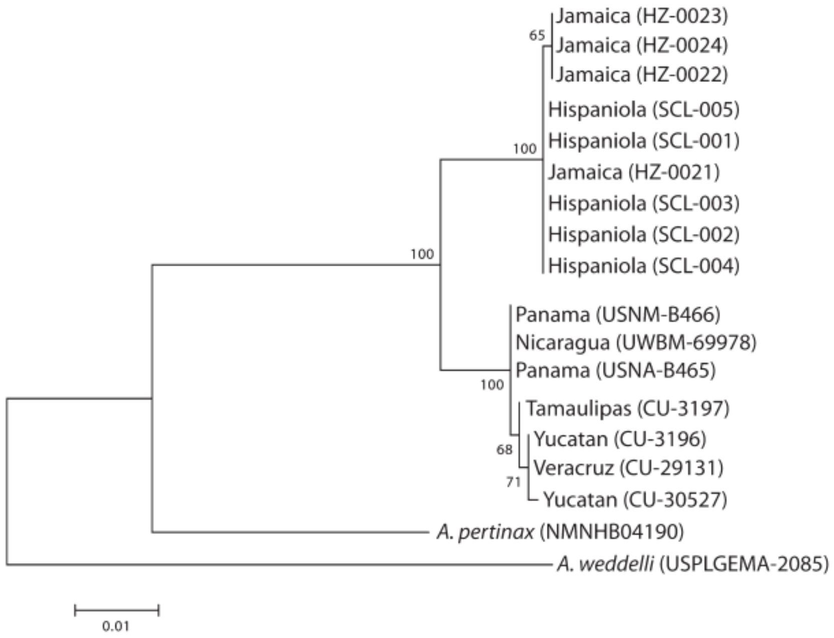

FIG. 3. Neighbor-joining tree (constructed in MEGA 4.1) showing relationships between the island and mainland populations of *A. nana*. The tree is "rooted" with two congeneric species (*A. pertinax* and *A. weddelli*). Values at nodes denote relative percent support from 2000 bootstrap iterations.

not differ from birds from Jamaica, and the authors suggested they represent an introduced population (Latta et al. 2010). Based on the degree of genetic divergence and reciprocal monophyly shown in the mtDNA sequences, together with morphological differences, Latta et al. (2010) suggested that *nana* and *astec* represent phylogenetic species, but did not comment on the potential for reproductive isolation. However, Latta et al. (2010) did note that the genetic divergence was similar to that between some currently recognized species of *Aratinga* parakeets.

Recommendation

Assessing the species status of insular taxa is a perpetual problem in systematics, and the case of these two *Eupsittula* parakeets, *nana* and *astec*, is no exception. The two were described as separate species and maintained as such by many authorities until the 1970s. In its first treatment of the group, the AOU *Check-list* (1983) treated them as a single species, and most global authorities have followed this treatment. However, the two have diverged in plumage, morphometrics (especially the "much larger and relatively deeper" bill of *nana*; Ridgway 1916), and genetics (Latta et al. 2010), albeit not very strongly. Based on these differences, the Handbook of Birds of the World and BirdLife International split the two taxa (del Hoyo and Collar 2014). The two taxa appear to be sister (Latta et al. 2010), although no phylogeny has included all *Eupsittula* taxa together, so there is still a possibility that *astec* or *nana* could be more closely related to another species. Given the morphological differences and genetic divergence (although only studied using one gene of mtDNA), I recommend splitting *E. astec* from *E. nana*, as the original lump of the taxa was not entirely well-justified, and seems to partly be based on comparisons of differences between species in different genera.

If split, I recommend using the names previously used for these taxa: Aztec Parakeet for *Eupsittula astec*, and Jamaican Parakeet for *Eupsittula nana*.

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Submitted by: Shawn M. Billerman, Cornell Lab of Ornithology

Date of Proposal: 8 August 2022

Treat *Amazona guatemalae* as a separate species from Mealy Parrot *A. farinosa*

Effect on AOS-CLC area:

Splitting *guatemalae* from *farinosa* would result in one additional species for the AOS area.

Background:

The Mealy Parrot (*Amazona farinosa*) occurs in southern Mexico, through all of Central America, parts of northern South America and the Amazon Basin, and also has a disjunct population in the Atlantic Forest of Brazil. Most authorities currently recognize 3-5 subspecies of *A. farinosa*, which are often split into two groups (*sensu* Clements et al. 2021): the Northern Mealy Parrot (*A. f. guatemalae* from the Caribbean slope of southeastern Mexico to northwestern Honduras and *A. f. virenticeps* from the Sula Valley of Honduras to extreme w Panama) and the Southern Mealy Parrot (*A. f. farinosa*, which occurs east and south from Panama to Colombia, Peru, Bolivia, the Guianas, and disjunctly in the Atlantic Forest of southeastern Brazil). Although most authorities consider the Southern Mealy Parrot to be monotypic, it is sometimes split into three subspecies, including *A. f. Inornata* (Panama and Colombia), *A. f. chapmani* (SE Peru to NW Bolivia), and *A. f. farinosa* in the central Amazon Basin and Atlantic Forest.

Until recent HBW-Birdlife and IOC splits, the two putative species have been treated as conspecific. HBW-BL split *A. farinosa* into two species based on the following rationale.

> Until recently, [*guatemalae*] was considered conspecific with *A. farinosa*, but differs in its yellow vs red lower carpal edge (2); blue-suffused (or blue) crown with broader, more heavily scaled nape feathers forming frequently or usually ruffled ruff or cape (3); blackish vs pale bill (2); black bristles on nares more extensive, and black shaft streaks on face (lores to below eye) (ns1); less powdery plumage (ns1); more oblong, less circular and slightly less broad white eye-patch (mensural score: allow 1). This split is supported by molecular analysis (Wenner, Russello & Wright 2012).

The IOC note on this issue is: "Northern Mealy Amazon is split from [Southern] Mealy Amazon (Wenner et al. 2012; HBW Alive)."

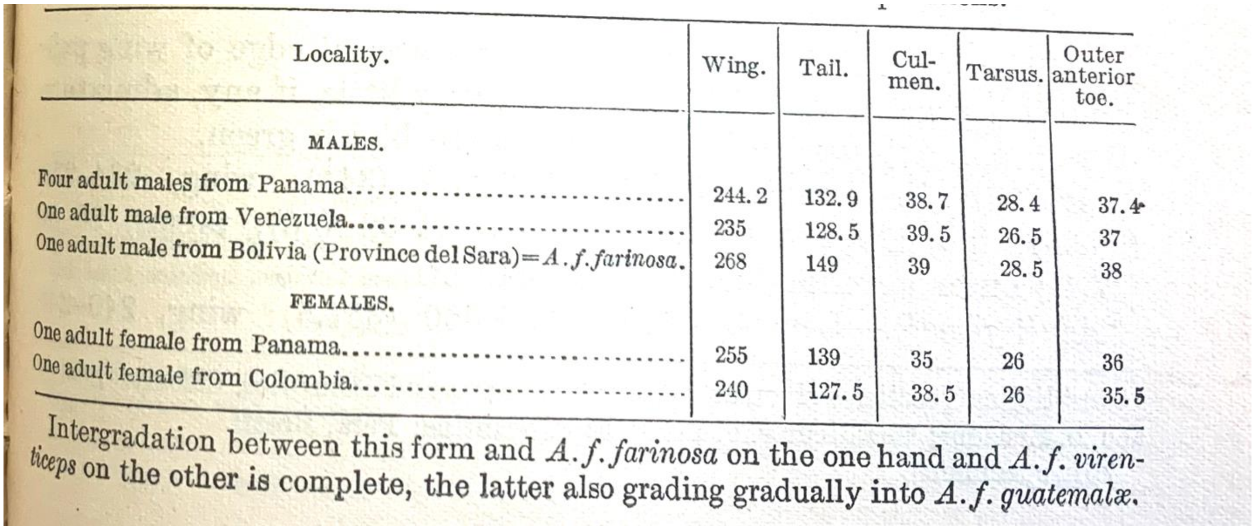
As suggested above, this proposed split is largely based on slight differences in plumage coloration between the Northern Mealy Parrot and Southern Mealy Parrot groups with support from population genetic data. The NACC and SACC have not yet considered these data in voting on species limits within the Mealy Parrot complex.

New Information:

Morphology:
This is not new information per se, but rather a synopsis of phenotypic differences between the Northern Mealy Parrot and Southern Mealy Parrot groups.

Ridgway (1916) determined that phenotypic variation between Central and South American lineages was clinal (Table 1). Although we assume that Ridgway was referring to the morphometric measurements that appear directly above his statement about intergradation, it's not absolutely clear whether he was referring to morphometrics, color, or some other aspect of phenotype.

Table 1: From Ridgway (1916), morphometric measurements of *A. f. inornata* and statement beneath stating that intergradation occurs between *A. f. farinosa* and *A. f. virenticeps*. We are unclear based on the placement of this statement what characters Ridgway (1916) was referring to, but believe the statement was in reference to morphometric characters.



Locality.	Wing.	Tail.	Cul-men.	Tarsus.	Outer anterior toe.
MALES.					
Four adult males from Panama	244. 2	132. 9	38. 7	28. 4	37. 4
One adult male from Venezuela	235	128. 5	39. 5	26. 5	37
One adult male from Bolivia (Province del Sara)=*A. f. farinosa*.	268	149	39	28. 5	38
FEMALES.					
One adult female from Panama	255	139	35	26	36
One adult female from Colombia	240	127. 5	38. 5	26	35. 5

Intergradation between this form and *A. f. farinosa* on the one hand and *A. f. virenticeps* on the other is complete, the latter also grading gradually into *A. f. guatemalæ*.

In contrast, Wetmore (1968) noted that *farinosa* (*inornata* from Panama) averaged larger in wing, tail, culmen (from cere), and tarsus length (Table 2). As mentioned above, the HBW split was based on the minor plumage differences summarized here. Bill color differs between the two, being pale in southern and blackish in northern. Crown color is blue or suffused blue in Northern Mealy Parrot while Southern Mealy Parrot lacks blue in the crown. Although Southern Mealy Parrots tend to show yellow in their crowns more often, some Northern Mealy Parrots also have yellow in their crowns. Northern Mealy Parrots also typically have more heavy scaling on their nape. Other differences include a yellow lower carpal edge in Northern Mealy Parrot, whereas this is red, yellow, or a combination of both in Southern Mealy Parrot. Also, Northern Mealy Parrots tend to have more extensive bristles on nares and shaft streaks on the face, less "powdery" plumage, and a more oblong and narrower white eye patch compared to Southern Mealy Parrots.

Table 2. Wetmore (1968) measurements

	wing	tail	Culmen from cere	tarsus
virenticeps male (n=9)	229.5 mm	122.9 mm	34.6 mm	28.1 mm
virenticeps female (n=8)	225.4 mm	123.7 mm	34.6 mm	28.1 mm
inornata male (n=10)	235 mm	131.7 mm	36.3 mm	29.3 mm
inornata female (n=8)	233.8 mm	132.7 mm	36.4 mm	28.6 mm

Below are Macaulay Library photos showing variation in some of these features, especially bill, crown, and eye ring.

Northern
https://macaulaylibrary.org/asset/433053151
https://macaulaylibrary.org/asset/439969671
https://macaulaylibrary.org/asset/465517171
https://macaulaylibrary.org/asset/432513681
https://macaulaylibrary.org/asset/417454551

Southern
https://macaulaylibrary.org/asset/364752721
https://macaulaylibrary.org/asset/422619441
https://macaulaylibrary.org/asset/364752631
https://macaulaylibrary.org/asset/406771601

Population genetics:
Wenner et al. (2012) sequenced two mtDNA gene regions (1,157 bp of Cyt b + COI combined) and two nuDNA introns (1,145 bp of TGFB2 + TROP combined) to examine phylogenetic structure among the five recognized subspecies of *A. farinosa* (Fig. 1). Hellmich et al. (2021) expanded on this study to include samples of the geographically disjunct Atlantic Forest population of the nominate *A. f. farinosa*. Aside from the addition of the Atlantic Forest population, the two data sets are identical. Although both nuDNA and mtDNA were included in these studies, the sampling matrix is incomplete such that multiple individuals are missing data from one or more loci or gene regions. Additionally, the number of parsimony-informative sites in the mtDNA data set (n = 96) was far more than the nuDNA data set (n = 5), such that the concatenated / combined phylogenetic data sets are largely driven by information contained in the mtDNA genome.

Wenner et al. (2012) recovered 16 cyt-b haplotypes with 28 sequence differences between Northern Mealy Parrot and Southern Mealy Parrot clades (Fig. 2). This corresponded to mtDNA distances of 3.5–5.4% between the two clades, which translates to an approximate divergence time of 1.75–2.7 mya during the late Pliocene to early Pleistocene.

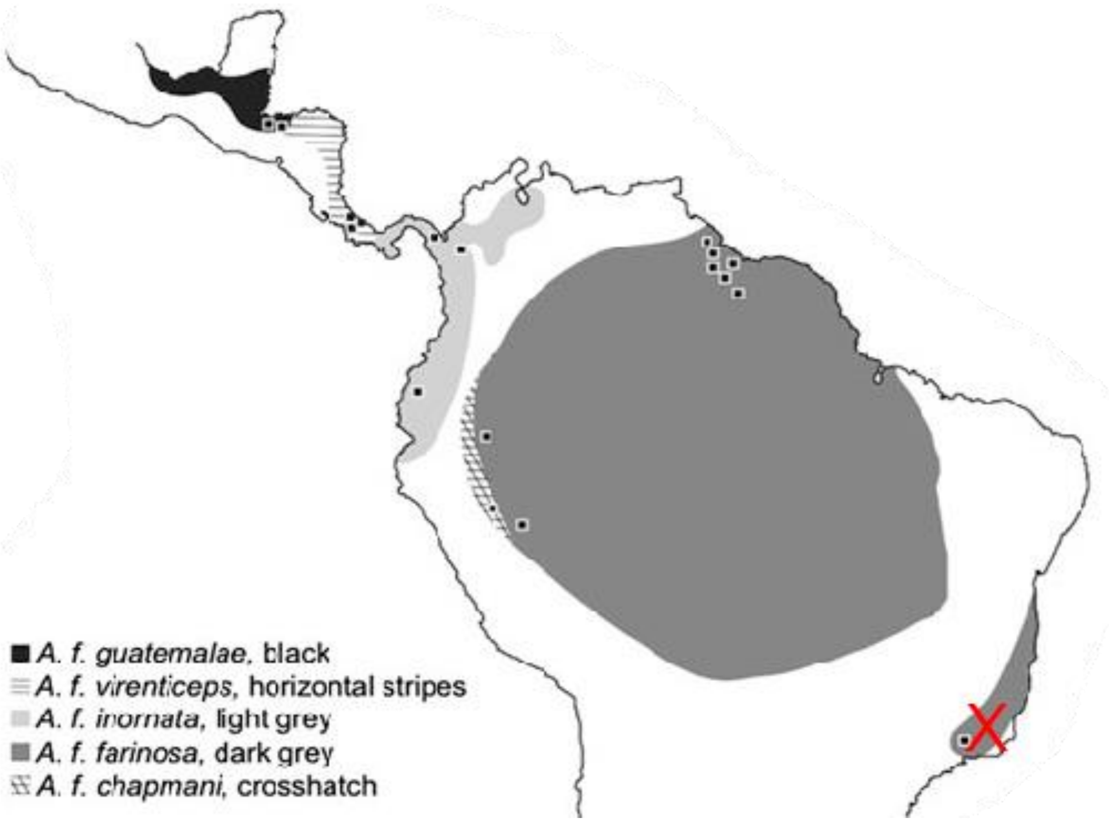


Figure 1: Sampling localities and ranges of currently recognized subspecies. Red “X” indicates approximate locality of additional samples from the Atlantic Forest of Brazil that were included by Hellmich et al. (2021).

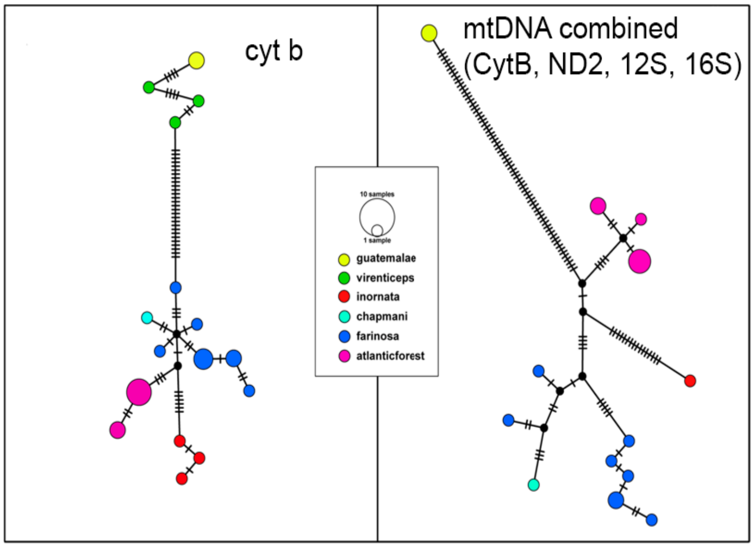


Figure 2: (Left panel) Median joining haplotype network based on CytB data. Size of each circle corresponds to the number of individuals sharing that haplotype and color to each clade. (Right panel) Median joining haplotype network based on 4 mitochondrial genes (CytB, ND2, 12S, 16S). Size of each circle corresponds to the number of individuals sharing that haplotype and color to each clade. Ticks on each branch represent the number of sequence differences between each haplotype.

Using their combined data set of mtDNA + nuDNA, Wenner et al. (2012) recovered reciprocal monophyly and a deep phylogenetic split between the Northern Mealy Parrot (*virenticeps* and *guatemalae*) and the Southern Mealy Parrot (*farinosa*, *inornata*, and *chapmani*). The nuDNA tree with the highest maximum likelihood score had very low bootstrap support for all of the nodes within the Mealy Parrot complex, essentially producing a polytomy (Fig. 3). Additional sampling of the Atlantic Forest population by Hellmich et al. (2021) recovered the same topology, and found that the Atlantic Forest population formed a monophyletic group (Fig. 4).

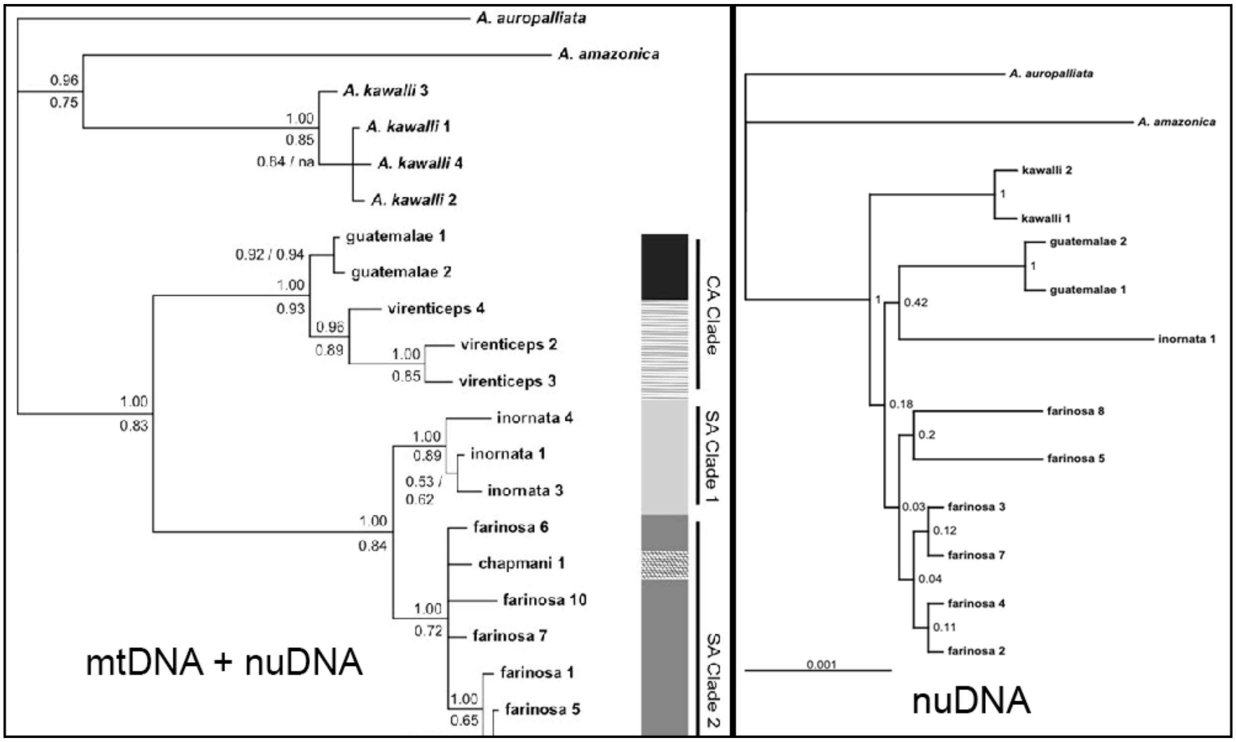


Figure 3: Phylogenies from combined mtDNA + nuDNA (left) and nuDNA alone (right) of Mealy Parrots from Wenner et al. (2012). Posterior probabilities are shown above each node while maximum likelihood bootstrap values are shown below, or to the side for the nuDNA alone phylogeny.

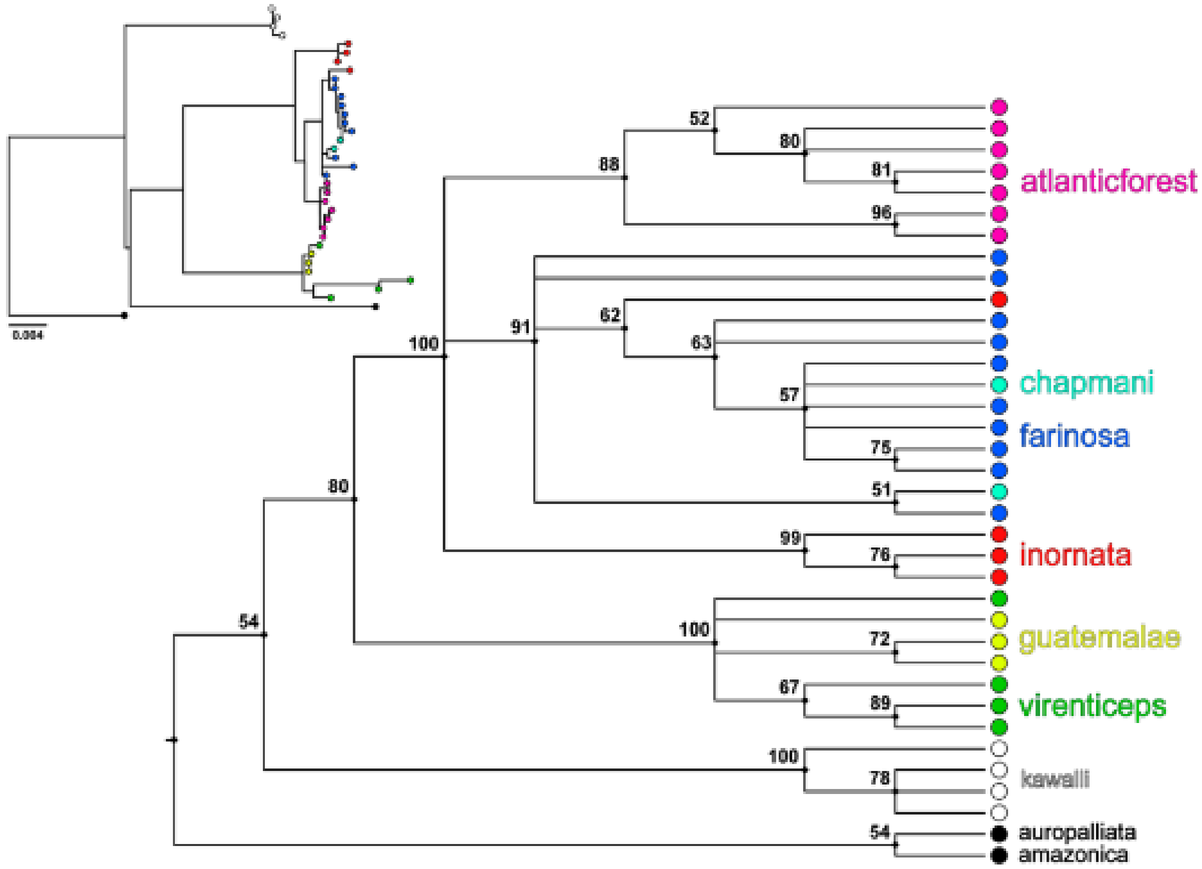


Figure 4: Maximum likelihood majority rule consensus tree (cladogram without branch lengths) based on combined nuDNA and mtDNA from Hellmich et al. (2021) with expanded Atlantic Forest sampling. Numbers to the left of each node are bootstrap consensus values. Top-left inset is a phylogram with branch lengths included that are proportional to sequence divergence.

Vocalizations:

Hellmich et al. (2021) used 150 samples of contact calls (Fig. 5) to investigate differences in call structure across the 5 subspecies and the Brazilian Atlantic forest populations. They found that variation within each subspecies was as great as between subspecies with substantial overlap in acoustic principal component space among clades (Fig. 6). They also found no correlation between genetic differentiation and vocal differentiation among clades.

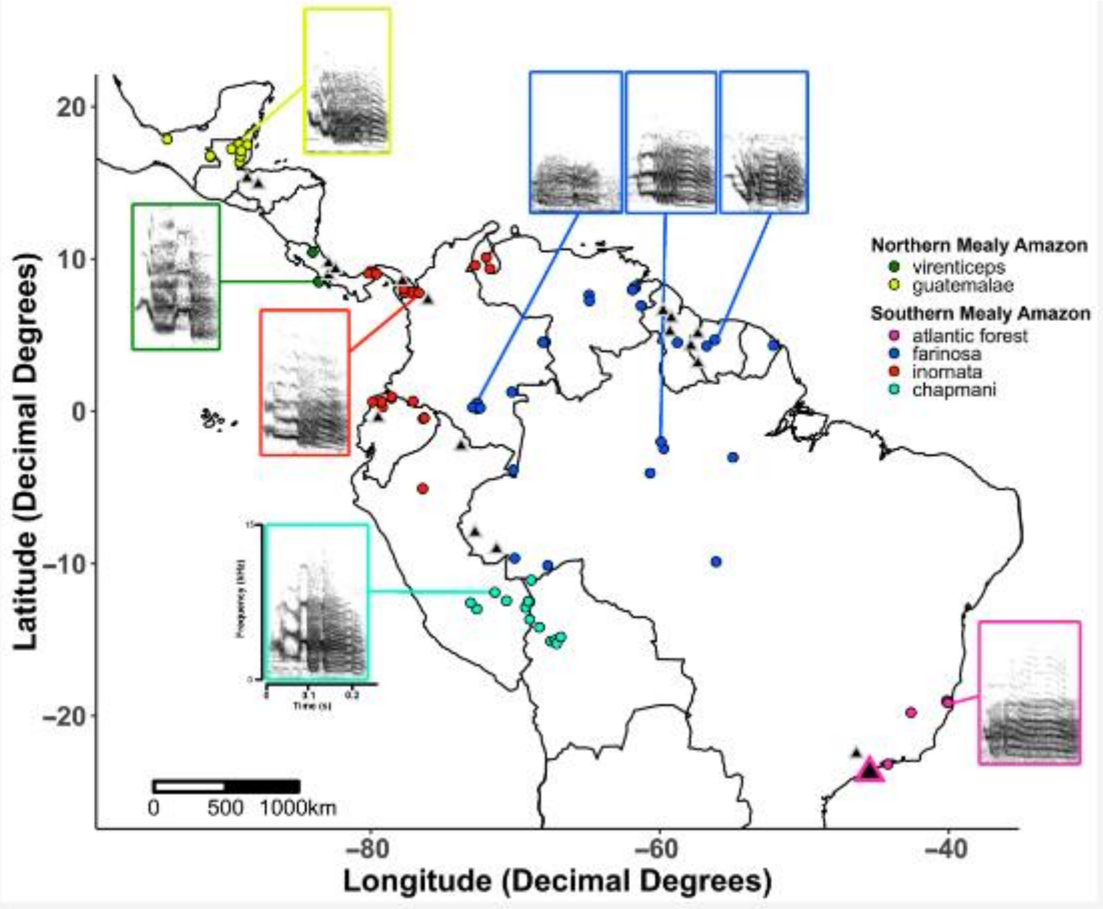


Figure 5: Map of vocal and genetic sampling locations from Hellmich et al. (2021). Spectrograms of representative calls from each clade are shown at their corresponding recording location. Genetic samples from the Wenner et al. (2012) study are indicated by grey-outlined triangles on the map. The location of the new genetic samples included in Hellmich et al. (2021) is indicated by the purple-outlined triangle.

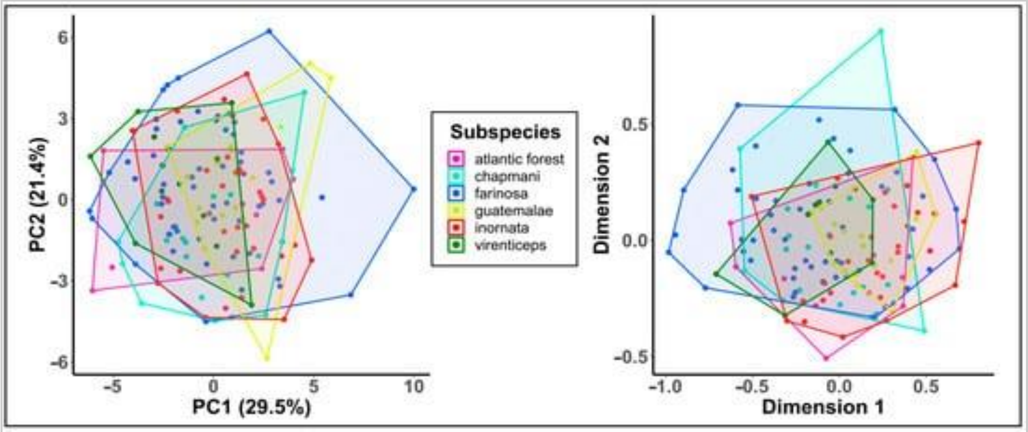


Figure 6: Acoustic variation in call data. Plots of acoustic variation in contact calls based on principal components analysis of 27 call measures (**left**) and a multidimensional scaling of spectrogram cross-correlation values (**right**). The points represent individual calls, and the polygons represent the total area occupied by each clade's set of calls in acoustic space. This is Figure 4 from Hellmich et al. (2021).

Recommendation:

Phenotypic differences between these groups are very slight—being limited to a few plumage characters that are not diagnostic—and may be clinal through the Isthmus of Panama. Vocalizations are variable throughout the complex and do not differ consistently between northern and southern groups. Although there is substantial mtDNA divergence (3.5–5.4%), no shared haplotypes, and reciprocal monophyly between the northern and southern groups, there is still a lot of uncertainty regarding contact zone dynamics. Most authorities state that the northern and southern groups are allopatric, but the evidence for this is unclear, and the distance between them is also unknown. Based on eBird records, the two groups appear to be separated by a narrow gap (~50 km) in central Panama, but current sampling for genetic analyses from the putative contact zone is sparse, and these subspecies can be difficult to distinguish in the field. Thus, the contact zone remains largely uncharacterized, both in terms of phenotypic and genetic differentiation. Mealy Parrots have also been commonly held in captivity throughout the region, both currently and historically by indigenous communities, which has increased opportunities for escapees to come into contact.

Taken together, we feel that although there is considerable evidence for cryptic speciation based on mtDNA divergence, the small amount of nuDNA is largely uninformative and does not recover the same pattern of deep reciprocal monophyly between Northern and Southern Mealy Parrots. Furthermore, the phenotypic differences are slight compared to other *Amazona* sister species, and the potential for hybridization in the contact zone remains unstudied. Acting conservatively, we therefore feel that Northern and Southern Mealy Parrots should not be split.

We recommend a NO vote on this proposal.

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Submitted By: David Vander Pluym and Nicholas A. Mason, Louisiana State University Museum of Natural Science and Department of Biological Sciences

Date of Proposal: 8 August 2022

Treat *Amazona tresmariae* as a separate species from Yellow-headed Parrot *A. oratrix*

Amazona oratrix is a species that shows geographic variation in body size and extent of yellow on the head and neck. One of four generally recognized subspecies, *A. o. tresmariae*, is endemic to the Tres Marías Islands. This subspecies was described as *Amazona oratrix tresmariae* by Nelson in 1900; the type locality is Maria Madre Island, México. The other three subspecies are continental: *A. o. oratrix* occurs in mainland Mexico on both Pacific and Atlantic slopes; *A. o. belizensis* in Belize, northeastern Guatemala, and northwestern Honduras; and *A. o. hondurensis* in the Sula Valley, Honduras, although AOU (1998) considered *hondurensis* to be a subspecies of Yellow-crowned Parrot (*Amazona ochrocephala*) (Ruth 2020).

The Birds of the World account (Ruth 2020) distinguished *tresmariae* as follows:

> Differs from other subspecies most conspicuously by the more extensive yellow of the head and neck, the yellow extending onto the throad [*sic*] and upper breast. Also averages larger in size with longer tail and wing (male), slightly paler green or light grass-green back, and more bluish green underparts. Underparts with glaucous cast or slightly tinged with blue, dark scalloping reduced. Odd red feathers on head, and more frequent yellow tips to upperwing covers, inner secondaries, and tail feathers (Forshaw 1977, Howell and Webb 1995, Juniper and Parr 1998).

Note that HBW-BL did not consider these differences sufficient to treat *tresmariae* as a separate species. The reason that this has come before WGAC is that the IOC split these based on the evolutionary species list of Navarro-Sigüenza and Peterson (2004) and the mtDNA study of Eberhard and Birmingham (2004), evidently some years ago. Prior to these publications, Howell and Webb (1995) did not treat *tresmariae* as a species, nor did they indicate that it might be split.

Ridgway (1916) recognized *A. oratrix* as a species with two subspecies (*A. o. oratrix* and *A. o. tresmariae*). He noted that *tresmariae* is similar to *oratrix* “but with bill more robust, the mandible decidedly broader, and green color less yellowish, especially on under parts, which are tinged with light cendre or pale emerald green, and with black terminal margins to feathers of back, chest, etc., very indistinct or obsolete.” It's notable that Ridgway did not list the plumage feature most often used to characterize *tresmariae*, which is the increased amount of yellow on the head, neck, and throat. Perhaps geographic, age-related, or individual variability in this character obscured the difference, although there is variation, and individuals with yellow throats are present on the mainland.

Cory (1918) also recognized *A. oratrix* as a single species with two subspecies (*A. o. oratrix* and *A. o. tresmariae*).

The other two subspecies were described more recently, *A. o. belizensis* as *Amazona ochrocephala belizensis* Monroe and Howell 1966, type locality Hill Bank, Orange Walk District, Belize. This subspecies is similar to nominate *oratrix* but has less yellow on the head and no yellow on the throat.

Amazona o. hondurensis Lousada and Howell 1997, type locality ca. 12 miles northeast of La Lima, along the Toloa canal at Urraco, Depto. Cortes, Honduras, is characterized by a yellow crown, frequently in a broad or triangular shape that covers most of forehead; some individuals have full yellow napes and some not. As mentioned above, some sources (e.g., AOU 1998) classify *hondurensis* as a subspecies of *Amazona ochrocephala*.

The more extensive yellow plumage of *A. o. tresmariae*, extending onto the throat and upper breast, can be seen in the left two specimens in these photos, although note that one of the skins of *oratrix* may be an immature bird:

Photos from Museo de Zoología, UNAM. The left two specimens are from Las Islas Marias (*tresmariae*), and the other two, the first of which is apparently an immature bird, are from Jalisco, Mexico (*oratrix*).

New information:

Eberhard and Bermingham (2004) analyzed phylogenetic relationships among members of the *Amazona ochrocephala* species complex (Fig. 1), including *oratrix* and *tresmariae*, using mitochondrial DNA sequence data (ATPase6, ATPase8, COI and ND2). Their results showed that the Middle American subspecies are all reciprocally monophyletic (*oratrix*, *tresmariae*, *belizensis*, *auropalliata*. and *panamensis*) and could be considered species, in contrast to the South American taxa, which were not monophyletic. They found that the samples of *A. o. tresmariae* formed a highly supported clade sister to a clade consisting of *A. o. oratrix, A. o. belizensis*, and *A. auropalliata* (Fig. 2), thus making *A. oratrix* paraphyletic. In addition, the branch leading to *tresmariae* is as long (or longer) than those leading to *auropalliata* and to *oratrix/belizensis*, although it should be noted that all divergences within the Central American group were minor (ca. 1%).

Figure 1. Distribution of the *Amazona ochrocephala* complex (Eberhard and Bermingham 2004).

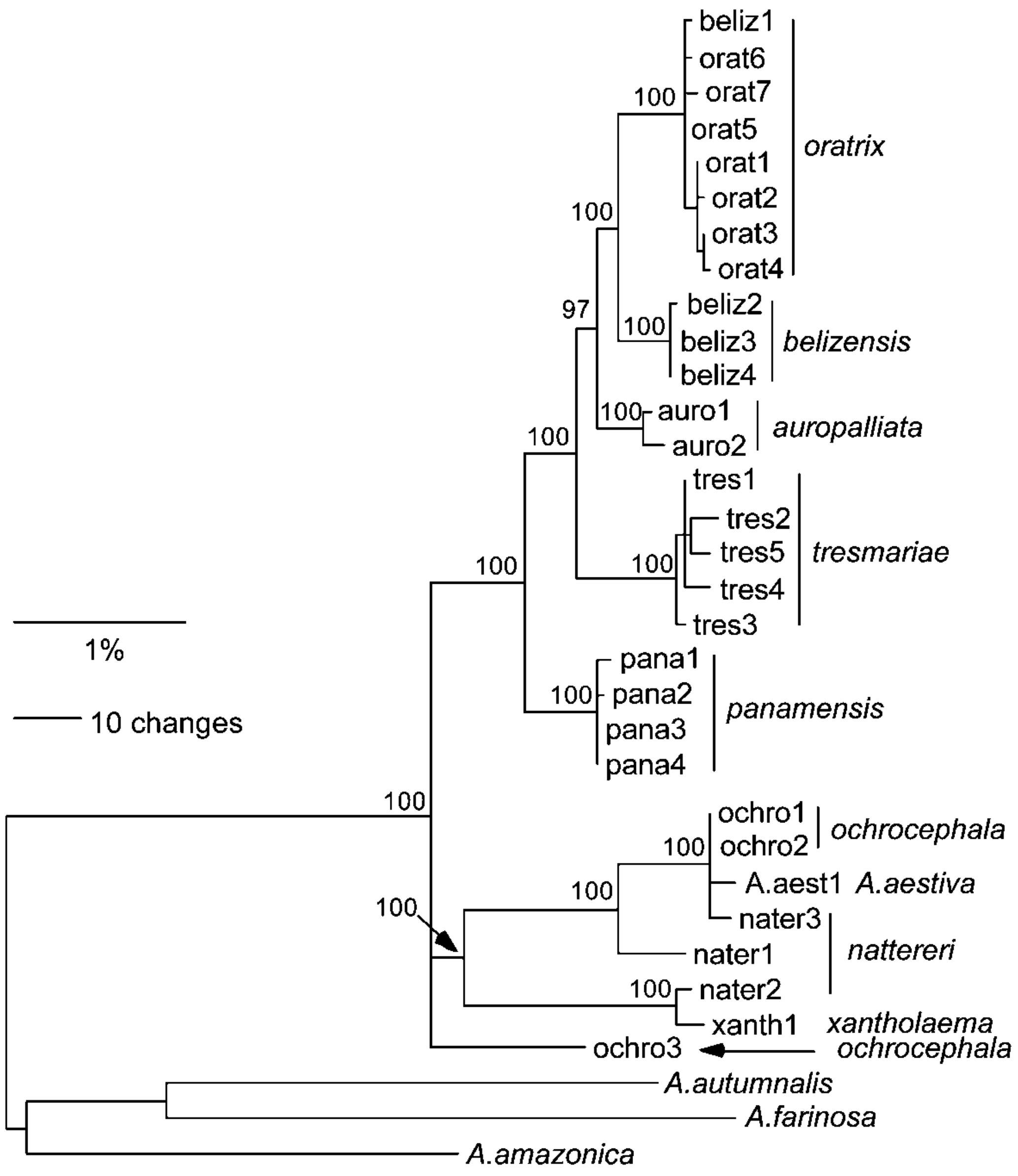


Fig. 2. Phylogram from Eberhard and Bermingham (2004) from a Bayesian analysis of mitochondrial ATPase6,8, COI, and ND2 sequences (2,514 bp).

Ribas et al. (2007) used mitochondrial sequence data for 45 representatives of the Yellow-headed Parrot complex, which now consists of *A. ochrocephala*, *A. oratrix*, and *A. auropalliata*, although at that time all were considered part of *A. ochrocephala*, as well as 13 individuals of *A. aestiva* (Blue-fronted Parrot) from South America (see their Fig. 1 below). They obtained new sequence data for the South American individuals but used sequences from Eberhard and Bermingham (2004) for the Middle American individuals. Their results corroborated the division of the Yellow-headed Parrot complex, supporting the monophyly of named subspecies from Middle America (*oratrix, tresmariae, belizensis, auropalliata,* and *panamensis*), as had been found previously by Eberhard and Bermingham (2004) and Russello and Amato (2004). The samples of *A. o. tresmariae* again formed a highly supported and distinctive clade sister to *A. o. oratrix, A. o. belizensis*, and *A. auropalliata*, although this result was based on the same data used by Eberhard and Bermingham (2004). They also identified within-clade divergence of the Central American group at only 1%.

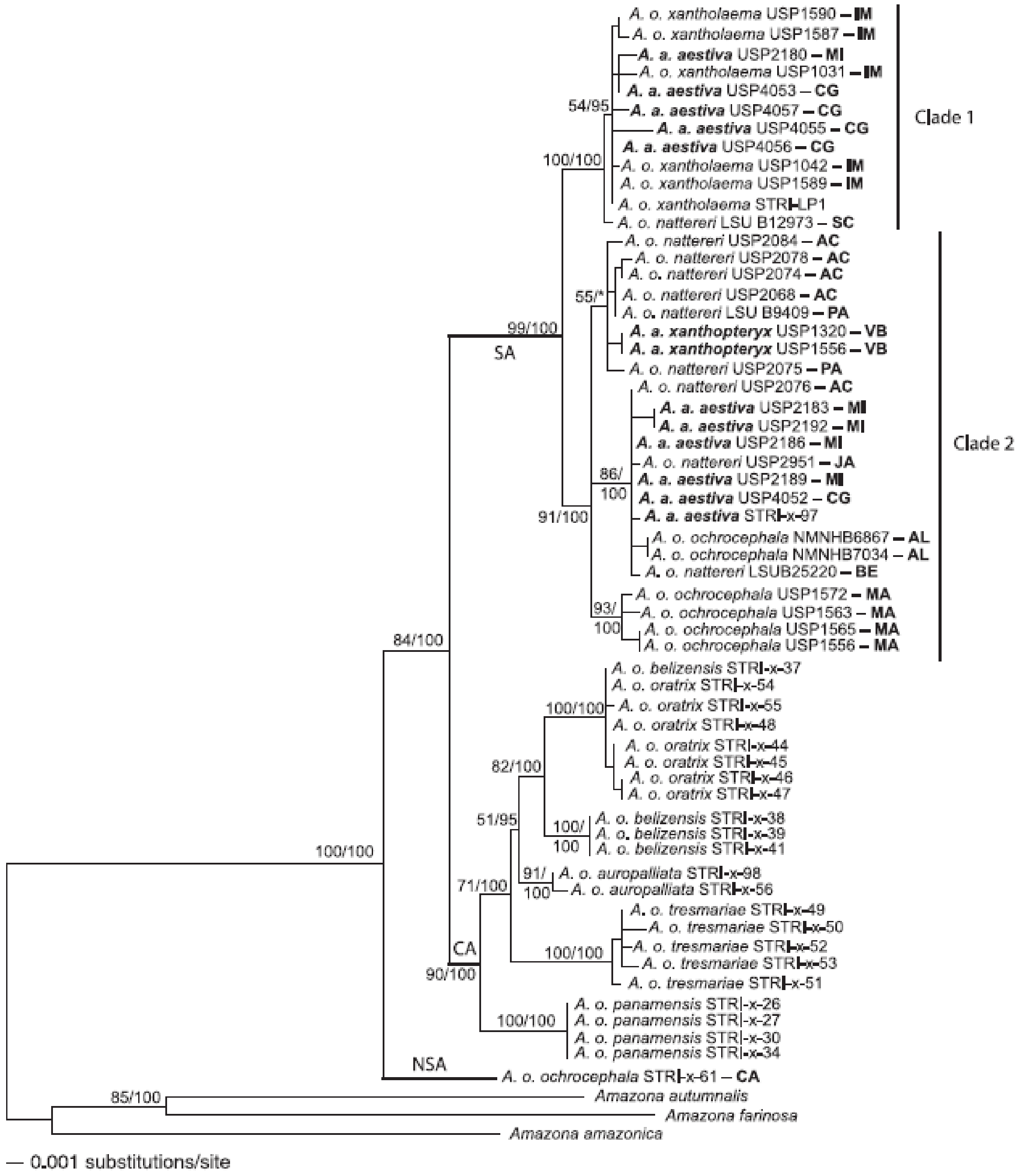


Figure 1. Topology derived from Bayesian analyses based on 1820 bp of mitochondrial sequences. Numbers on the nodes are maximum parsimony bootstrap percentages and Bayesian posterior probabilities, respectively. *Indicates posterior probability smaller than 85%. Clades 1 and 2 are indicated by vertical lines. South American (SA), Central American (CA) and Northern South American (NSA) lineages are indicated by bold branches. Voucher numbers and locality codes are indicated after each taxon name (see Fig. 2 and Appendix 1).

Urantówka et al (2014) conducted a study of the genus *Amazona* but with an emphasis on *A. barbadensis*, using various combinations of genes and phylogenetic approaches. They reanalyzed the data from Eberhard and Bermingham (2004) and Ribas et al. (2004) but also added the mitochondrial genome of *A. barbadensis*. Their results with respect to *tresmariae* (see their Fig. 2 below, one of many trees in their paper) were, not surprisingly, similar to those of Eberhard and Bermingham (2004) and Ribas et al. (2004).

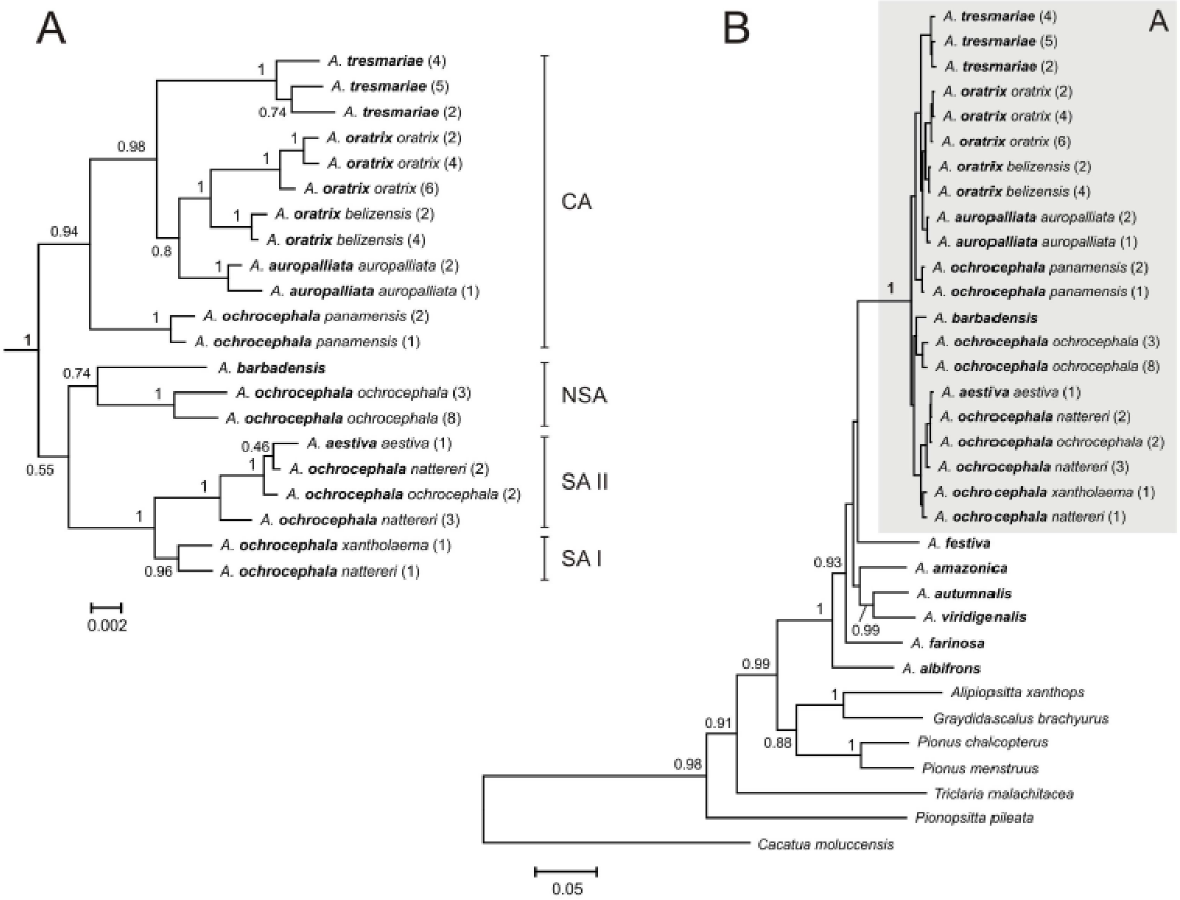


Figure 2. The Bayesian tree for the YHA complex (A) and all taxa (B) based on nd+cox^2 data set. See Figure 1 for other explanations.
doi:10.1371/journal.pone.0097228.g002

Chaves et al. (2014) used a DNA Surveillance platform to build an online database tool for molecular identification of Brazilian psittacids using DNA sequences of six mitochondrial genes, but focused on *Amazona aestiva*, one of the most common parrots in Brazil and considered to be part of a species complex with *Amazona ochrocephala* from South America. They concluded, as had Eberhard and Bermingham (2004), that there is a strong phylogenetic structure in the Central American lineage (this group includes *A. tresmariae*, *A. oratrix*, and *A. auropalliata*), contrasting with a lack of structure in the South American lineage.

Table 2. AMOVA results.

	ND2 (502 bp)		COI (401 bp)		ND2-COI (903 bp)	
	ΦST	FST	ΦST	FST	ΦST	FST
Between SA, CA, NSA groups	0.59734	0.18371	0.73730	0.30803	0.63712	0.14841
South America (between SA × NSA)	0.43994	0.22504	0.65709	0.41608	0.47586	0.22855
Between SA (Clade 1 × Clade 2)	0.38830	0.21707	0.55670	0.42132	0.41253	0.22287
Between *A. aestiva* × *A. ochrocephala*	0.15029	0.06961	0.12170	0.08798	0.13511	0.06899

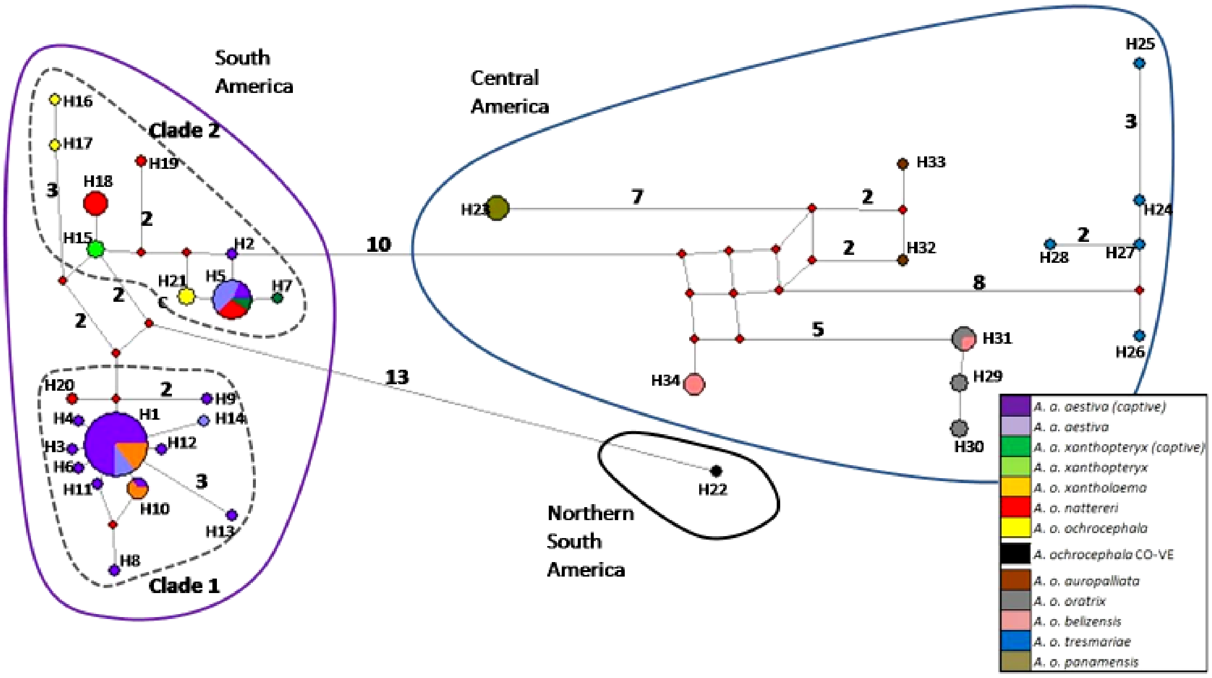
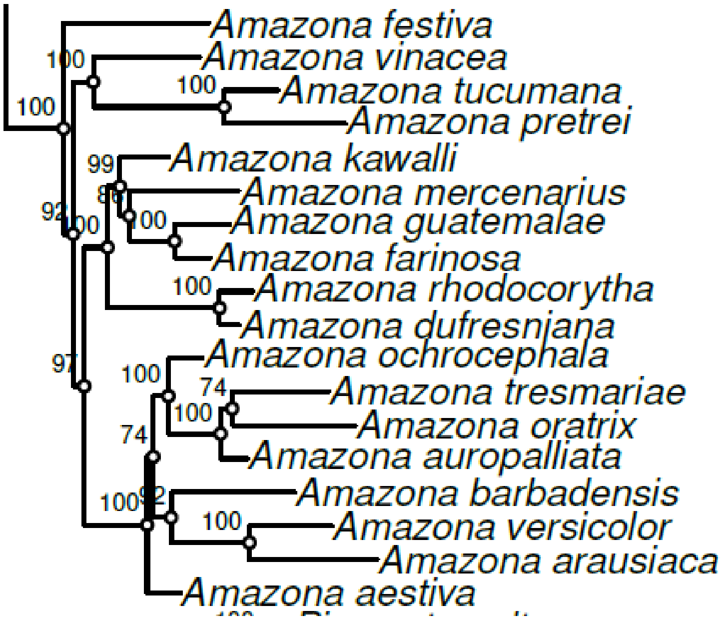


Figure 2. Haplotype network based on 902 bp of ND2 and COI of captive *A. aestiva* and other specimens of the *A. aestiva*/*A. ochocephala* complex. The number of substitutions is proportional to the length of the line connecting haplotypes and is also shown. The size of the circles is proportional to the frequency of the haplotype obtained in this sample. Red diamonds represent median vectors.

Smith et al. (2022) recently provided a nuclear perspective on relationships in the Psittacidae, using a dataset of 3200 UCEs for 385 individuals. Their sampling included individuals of several relevant taxa, although, considering that this was a phylogenetic study of the entire family, only single individuals per taxon were sequenced. Relevant included taxa were *A. ochrocephala*, *A. oratrix oratrix*, *A. o. tresmariae*, and *A. auropalliata*, as well as *A. barbardensis*, and *A. aestiva*. Seventy individuals, including *A. oratrix*, had ca. 10% or more missing data. Localities for these samples were as follows:

Amazona ochrocephala	Bolivia	Pando
Amazona oratrix	Mexico	Veracruz, Panuco
Amazona tresmariae	Mexico	Nayarit, San Blas, Maria Cleofas Island
Amazona auropalliata	Nicaragua	Dpto. de Rivas, La Flor, shore of Pacific Ocean

The relevant part of their concatenated tree including all individuals (an ML tree estimated in IQ-TREE2 with 1000 rapid bootstraps) is here:



Note that *oratrix* and *tresmariae* are sister taxa in this tree, unlike the various mitochondrial trees that indicated that *oratrix*, if including *tresmariae*, is paraphyletic with respect to *auropalliata*, although bootstrap support for this is only 74%. Branch lengths for *oratrix* and *tresmariae* are long relative to that of *auropalliata*, but these may have been affected by the small population size of *tresmariae* and the missing data for *oratrix* and should be considered in the light of the small mitochondrial divergences. Unfortunately, neither *panamensis*, which is considered a subspecies of *ochrocephala* but which is sister to the *oratrix* group in the mtDNA studies, nor *hondurensis*, the subspecies considered part of *ochrocephala* by AOU (1998) but part of *oratrix* by some other sources, was sampled.

Vocalizations:

Vocalizations from *tresmariae* and the *oratrix* group are available in the Macaulay Library, and they have some differences between them, but those differences can be explained by differences in body size. The *tresmariae* group is larger in body size than the *oratrix* group, and *tresmariae* has deeper calls, whereas the *oratrix* group has higher pitched calls.

Amazona oratrix tresmariae
https://search.macaulaylibrary.org/catalog?taxonCode=yehpar2&mediaType=audio

Amazona oratrix (mainland)

https://search.macaulaylibrary.org/catalog?taxonCode=yehpar&mediaType=audio

There are no vocalizations in Xeno-canto from *tresmariae*, only from the *oratrix* group.

Summary and contextualization of new findings:

As Ruth (2020) mentioned, *A. oratrix* exhibits geographic variation in size and the extent of yellow on the head and neck, resulting in recognition of two major groups, one monotypic in the Tres Marias Islands (*tresmariae*) and the polytypic mainland group (*oratrix* group). Taxonomic and species limits within *A. oratrix* are subject to interpretation, but the mtDNA studies of Eberhard and Bermingham (2004), Ribas et al. (2007), and Urantówka et al. (2014), using the same molecular but adding more taxa, consistently show *A. tresmariae* to form a separate, highly supported clade.

Recommendation:

BH recommends the separation of *A. tresmariae* from *A. oratrix*. These two taxa have marked differences in morphology, genetics, and vocalizations. The molecular data show that *A. tresmariae* forms a clade distinct from continental populations of *A. oratrix* and that *A. auropalliata* is less distinctive genetically than *tresmariae*.

RTC is more ambivalent about the proposed split and leans against recognizing *tresmariae* as a species. To RTC, the morphological and vocal differences, the latter of which have not been analyzed and appear to be subtle, currently seem more consistent with subspecies status than with species status (e.g., neither HBW-BL, Ridgway, nor Cory separated them as species based on morphology). Although the trees based on mtDNA show that *oratrix* is paraphyletic with respect to *auropalliata* if *tresmariae* is included, *oratrix* and *tresmariae* form a monophyletic group in the UCE analysis of Smith et al. (2022). The branch lengths for *tresmariae* equal or exceed those of many closely related species of *Amazona*, but this is likely heavily affected by its small population size. Moreover, as the mitochondrial studies have noted, the entire Middle American clade (*oratrix, tresmariae, auropalliata*, and evidently *panamensis*) is characterized by low divergences, ca. 1%. It may be more appropriate to consider a proposal to lump *auropalliata* with *oratrix* rather than to split *tresmariae*, especially in light of the morphological intermediacy of *auropalliata parvipes* and *auropalliata caribaea* between nominate *auropalliata* and *oratrix* (Lousada and Howell 1996).

English names:

If the split is accepted, then the English name for *Amazona tresmariae* should be Tres Marias Parrot, as suggested by Nelson 1900 and used by others since. *Amazona oratrix* would retain the name Yellow-headed Parrot based on its much larger distribution.

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