Remarks on the Costa Rican expeditions of Ridgway and Zeledón in 1905 and 1908, with a focus on three type localities

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Remarks on the Costa Rican expeditions of Ridgway and Zeledón in 1905 and 1908, with a focus on three type localities

by Matthew R. Halley

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Summary.—A unique reprint of M. A. Carriker's classic article, 'An annotated list of the birds of Costa Rica including Cocos Island' (1910), contains handwritten annotations by Robert Ridgway (1850–1929) that pertain to three type localities from his 1905 and 1908 expeditions with José Castulo Zeledón (1846–1923): Bonilla, Coliblanco and Guayábo. Hundreds of specimens in modern collections were taken at these localities, including the types of Zeledón's Antbird *Hafferia zeledoni* (Ridgway, 1909) and eight other taxa currently treated as subspecies. The annotations also reveal discrepancies between primary and secondary sources, which cast doubt on Francisco Basulto's role as collector of the holotypes of the northern subspecies of White-ringed Flycatcher *Conopias albovittatus distinctus* (Ridgway, 1908) and the south-eastern subspecies of Fawn-throated Foliage-gleaner *Automolus cervinigularis hypophaeus* Ridgway, 1909.

During his long tenure as curator of birds at the National Museum of Natural History, Smithsonian Institution, Washington DC (USNM), Robert Ridgway (1850–1929; Fig. 1) made two collecting trips to Costa Rica. The first lasted from 8 December 1904 to 27 May 1905; and the second from 7 February to 8 May 1908 (Ridgway 1905, Grinnell 1908, Wetmore 1931). On both trips, Ridgway was accompanied by José Castulo Zeledón (1846–1923; Fig. 1) and many of their specimens were subsequently designated (by Ridgway and others) as the name-bearing types of new taxa (Deignan 1961). Hundreds of specimens from the 1905 and 1908 expeditions of Ridgway and Zeledón are preserved in modern collections, primarily at USNM and the American Museum of Natural History, New York (AMNH). AMNH received their specimens in exchange with USNM; the 1905 specimens arrived in June 1920, and the 1908 specimens arrived after 1924 (P. Sweet *in litt*. 2023).

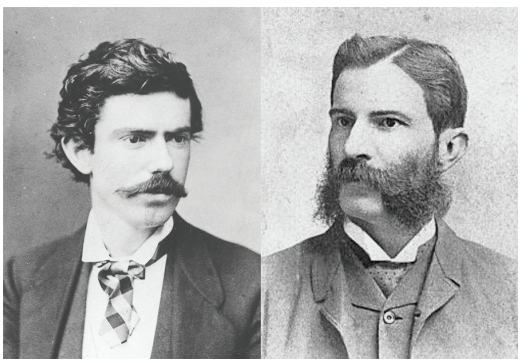

Figure 1. (left) Robert Ridgway (1850–1929), taken in 1867, courtesy of Smithsonian Institution; (right) José Castulo Zeledón (1846–1923), reproduced from Ridgway (1923).

Ridgway and Zeledón travelled on the old Costa Rican railway system, on rail lines that used to follow the Río Reventazón, north-east toward Puerto Limón, but which have been inoperative and deteriorating since the 1990s (Fig. 2). Of this particular stretch of the old railway, Elliott (1985) wrote (my comments in brackets):

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> 'The turbulent Rio Reventazon (its name suggests how likely it is to burst its banks) begins to play an elaborate fugue with the track, and the train, with its open windows, provides an ideal perch for appreciating it. The mountains [south-eastern slopes of Volcán Turrialba] rise steep and wooded on the left, and the white water and eddies rush by below on the right; sometimes the trestles teeter 200 feet above the river … Past [the town of] Turrialba, where the coffee plantations, or fincas, are thick and plenty, the vegetation grows denser, dense as the jungle thickets in the canvases of the Douanier [Henri] Rousseau.'

Costa Rica lacks an 'ornithological gazetteer' (e.g., Paynter 1993, 1997) and some of the type localities of Ridgway and Zeledón, which they accessed from the old railway stations, have proven difficult to locate on modern maps. Here, I draw attention to overlooked marginalia in (what appears to be) Ridgway's own copy of Carriker's classic article, 'An annotated list of the birds of Costa Rica including Cocos Island' (1910), which is preserved in a tattered condition in the library of the Delaware Museum of Nature & Science (DMNH, formerly Delaware Museum of Natural History), Wilmington. A name plate on the inside front cover, bearing the logo of the 'Wilson Ornithological Club' (now Wilson Ornithological Society), indicates that the book was formerly in the library of Josselyn Van Tyne (1902–57), and therefore was likely deaccessioned from the Josselyn Van Tyne Memorial Library at the University of Michigan Museum of Zoology, Ann Arbor (UMMZ). To my knowledge, Ridgway's annotations were overlooked until 2023, when by happenstance I noticed them in the DMNH library. Details of the presumed transfer from UMMZ are not known at present.

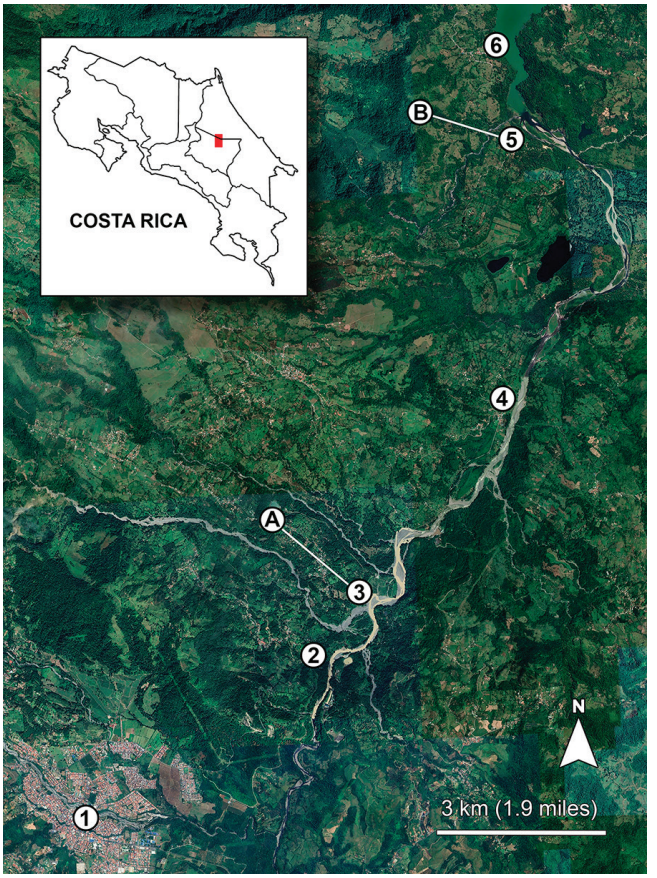

Figure 2. Satellite map of the relevant section of the Río Reventazón, Costa Rica (red rectangle in inset), marked with the confirmed or probable locations of historic railway stations (1–6, 'Antigua Estaciónes de Ferrocarril') and the probable locations of the haciendas of 'Guayábo' (A) and 'Bonilla' (B), where the expedition party collected their type specimens. Along this stretch of the river, the old railway followed the west bank of the Río Reventazón with stations at Turrialba (1), Jesús María (2), Guayábo (3), Peralta (4), Bonilla (5) and Pascua (6). Satellite imagery created in Google Earth Pro.

Here, I transcribe and discuss the annotations initialled by Ridgway ('R.R.') in the DMNH reprint, and other (un-initialled) annotations that appear in similar handwriting. The annotations clarify the locations and elevations of three type localities—Bonilla, Coliblanco and Guayábo—

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TABLE 1
List of taxa described with holotypes collected at Bonilla (n = 4), Coliblanco (n = 1) and Guayábo (n = 6), and their current taxonomic rank following Gill *et al.* (2023). Within each type locality, taxa are listed in chronological order of their original descriptions.

type locality	taxon	holotype	current rank
Bonilla	*Tityra semifasciata costaricensis* Ridgway, 1906	USNM 199039	subspecies
	Thamnistes anabatinus saturatus Ridgway, 1908	USNM 199066	subspecies
	Discosura conversii salvini (Ridgway, 1911)	USNM 199271	junior synonym
	Chrysothlypis chrysomelas titanota Olson, 1981	USNM 209197	subspecies
Coliblanco	*Lepidocolaptes affinis neglectus* (Ridgway, 1909)	USNM 199582	subspecies
Guayábo	*Conopias albovittatus distinctus* (Ridgway, 1908)	USNM 209464	subspecies
	Automolus cervinigularis hypophaeus Ridgway, 1909	USNM 209532	subspecies
	Hafferia zeledoni (Ridgway, 1909)	USNM 209558	species
	Chaetura vauxi richmondi Ridgway, 1910	USNM 209570	subspecies
	Aulacorhynchus caeruleogularis maxillaris Griscom, 1924	AMNH 153922	junior synonym
	Xenops rutilus septentrionalis J. T. Zimmer, 1929	FMNH 35744	subspecies

where hundreds of specimens in the USNM, AMNH and a few smaller institutions, were collected in 1905 and 1908. To my knowledge, of the 11 taxa described from these localities, only *Xenops rutilus septentrionalis* J. T. Zimmer, 1929 (Furnariidae) was based on a specimen (FMNH 35744) not collected during the joint expeditions of Ridgway and Zeledón (Table 1). For historical reasons, material from these important expeditions is almost entirely confined to North American institutions. A search of the online database of the Museo Nacional de Costa Rica (MNCR) bird collection yielded only one specimen from the three aforementioned localities: MNCR O24341, an unsexed Bright-rumped Attila *Attila spadiceus* (J. F. Gmelin, 1789) collected on 31 March 1905 at 'Bonilla'.

Bonilla

Carriker (1910: 336) wrote that Bonilla was 'a station on the railway from Limon to San Jose … at an altitude of 1,000 to 1,200 feet' (305–366 m). However, in his annotation, Ridgway clarified (my italics): 'The *hacienda* of Bonilla, where Zeledón [and] Ridgway collected, is on a spur of Turrialba, at an elevation of 2600 ft. [= 792 m], or *more than 1000 feet above* the Railway station of that name.–R.R.' (Fig. 3). This clarifies Ridgway's (1905: 155) earlier statement that Bonilla was 'an estate of 3000 acres belonging to Don Francisco Lopes Calleja', to which he and Zeledón travelled after 'leaving the train a few miles below the town of Turrialba … [their] outfit being transported on horses up the steep and rough mountain trial [*sic*].'

No train station named 'Bonilla' appears on the 'Sketch map of the Costa Rica railways', published in 1903, nor on modern maps; but this may simply indicate that it was a minor station (i.e., a platform without a building). Presumably, Bonilla station was located between the major stations at Peralta and Pascua (Durán Segura 2018), on the west bank of the Río Reventazón near its confluence with the Río Bonilla (Fig. 2; *c.*10°00′37.08″N, 83°36′20.88″W). The precise course of the old railway between Pascua and Peralta is difficult to discern in satellite imagery, but is clearly marked on the 'default' view in Google Maps (accessed 7 February 2024); the old Pascua station ('Antigua Estación de Ferrocarril Pascua' on Google maps) is now submerged under the Laguna del Reventazón, a man-made

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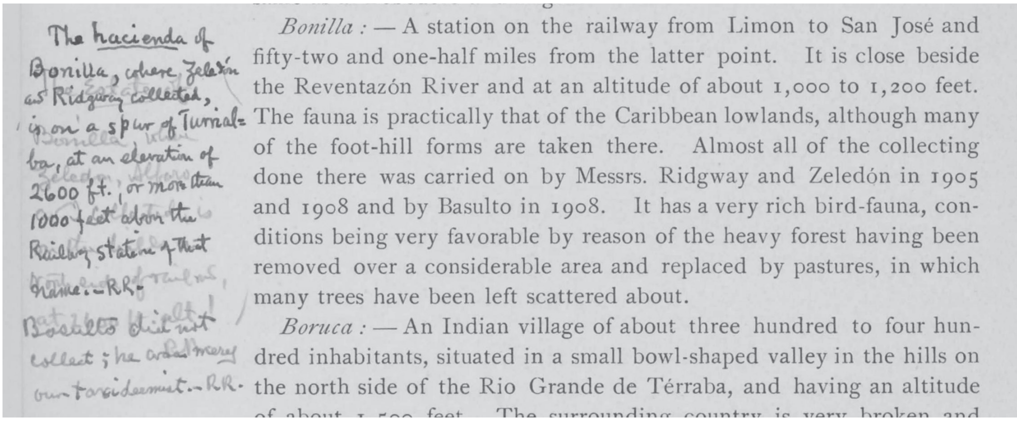

The hacienda of Bonilla, where Zeledón & Ridgway collected, is on a spur of Turrialba, at an elevation of 2600 ft., or more than 1000 feet above the Railway station of that name.—R.R.

Basulto did not collect; he was merely our taxidermist.—R.R.

Bonilla : — A station on the railway from Limon to San José and fifty-two and one-half miles from the latter point. It is close beside the Reventazón River and at an altitude of about 1,000 to 1,200 feet. The fauna is practically that of the Caribbean lowlands, although many of the foot-hill forms are taken there. Almost all of the collecting done there was carried on by Messrs. Ridgway and Zeledón in 1905 and 1908 and by Basulto in 1908. It has a very rich bird-fauna, conditions being very favorable by reason of the heavy forest having been removed over a considerable area and replaced by pastures, in which many trees have been left scattered about.

Boruca : — An Indian village of about three hundred to four hundred inhabitants, situated in a small bowl-shaped valley in the hills on the north side of the Rio Grande de Térraba, and having an altitude

Figure 3. Ridgway's annotations to the 'Bonilla' account in Carriker (1910); reproduced courtesy of the Delaware Museum of Nature & Science (Matthew R. Halley)

impoundment created by the Reventazón dam in 2016. Therefore, the hacienda of Bonilla—the type locality of *Thamnistes anabatinus saturatus* Ridgway, 1908 (Thamnophilidae), *Tityra semifasciata costaricensis* Ridgway, 1906 (Tityridae) and *Chrysothlypis chrysomelas titanota* Olson, 1981 (Thraupidae)—was probably located in the hills that rise from the west bank of the Río Bonilla (Fig. 2), which attain a max. elevation of *c.*800 m (i.e., 'up the steep and rough mountain trial [*sic*]', Ridgway 1905: 155).

In 1905, the expedition party collected at Bonilla from 24 March to 11 April according to data from study skin labels. The USNM database lists 520 specimens collected at this locality in 1905, including five partials (trunks) preserved in alcohol and one skeleton (C. Milensky *in litt*. 2023). Approximately 77 study skins are at AMNH; three are at the Western Foundation of Vertebrate Zoology, Camarillo (WFVZ 32602, 32603, 43265); and one is at the Museum of Vertebrate Zoology, Berkeley (MVZ 101946), according to the VertNet.org database (accessed 21 August 2023). In this online sample (*n* = 474 specimens), Ridgway is listed as the sole collector of 291 skins; Zeledón as sole collector of 110; Anastasio Alfaro (1865–1951), Director of the Costa Rica National Museum (see Ridgway 1905), as sole collector of 74; Ridgway and Zeledón are jointly listed as collectors of two (AMNH 154108, 185403); Adan Lizano is listed as the sole collector of one (USNM 199050); and four skins have no collector data. Online databases contain many errors, and may not reflect the current state of the internal databases of specimen-holding institutions, or accurately portray what happened in the field. Nevertheless, these numbers at least provide a rough estimate of how 'collector data' have been apportioned, which may be useful for resolving discrepancies (see below).

In 1908, according to the USNM specimen ledger and database, the expedition arrived at Bonilla no later than 30 March, stayed there until at least 19 April, and collected a total of 240 study skins (C. Milensky *in litt*. 2023). In addition, two skins of King Vulture *Sarcoramphus papa* (Linnaeus, 1758) were collected at Bonilla by 'Francisco Lopez Calleja' (i.e., the proprietor of the hacienda) on 25 and 27 March (USNM 209845 and 209846, respectively), possibly before the party arrived. Curiously, in the VertNet database (*n* = 224 skins, accessed 21 August 2023), Ridgway and Zeledón are not listed as collectors of any of the Bonilla material from 1908, although Carriker (1910: 336) wrote that 'Almost all of the collecting done [at Bonilla] was carried on by Messrs. Ridgway and Zeledon in 1905 and 1908 and by Basulto in 1908.'

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TABLE 2
List of specimens (n = 10) collected by Ridgway and/or Zeledón in April 1908, transcribed directly from digital scans of the USNM ledger (i.e., not retrieved from a database), and arranged chronologically.

date	voucher	species	location
3 April	USNM 209830	*Glaucidium brasilianum* (J. F. Gmelin, 1788)	San José
4 April	USNM 209330	*Zonotrichia capensis* (Statius Müller, 1776)	San José
4 April	USNM 209331	*Zonotrichia capensis* (Statius Müller, 1776)	San José
4 April	USNM 209440	*Elaenia flavogaster* (Thunberg, 1822)	San José
9 April	USNM 209008	*Cantorchilus nigricapillus* (P. L. Sclater, 1860)	'Volc. de Turrialba'
11 April	USNM 209502	*Procnias tricarunculatus* (Verreaux & Verreaux, 1853)	'Volc. de Irazú'
21 April	USNM 209344	*Atlapetes gutturalis* (Lafresnaye, 1843)	San José
28 April	USNM 209829	*Glaucidium brasilianum* (J. F. Gmelin, 1788)	San José
29 April	USNM 209109	*Vireo flavoviridis* (Cassin, 1851)	San José
29 April	USNM 209321	*Piranga bidentata* (Swainson, 1827)	San José

In the VertNet sample, Francisco Basulto ('of Cienfuegos, Cuba', Ridgway 1908: 191) is credited as the sole collector of all but one of the 1908 Bonilla specimens (n = 223/224), including the holotype of *Chrysothlypis chrysomelas titanota* Olson, 1981 (USNM 209197). The only outlier is USNM 209008, which was collected by 'Ridgway and Zeledon' but misattributed to 'Bonilla' in the database (i.e., the ledger gives 'Volc. de Turrialba' as the locality). Primary sources indicate that Basulto collected at least 16 skins at Bonilla on 30 March 1908 (e.g., USNM 209719) and, on the same day, Ridgway and Zeledón collected 25 skins at Guayábo, where they had arrived by 2 March (USNM 209366) and remained until at least 31 March (e.g., USNM 209448). Basulto had apparently been present with Ridgway and Zeledón at Guayábo, before he went to Bonilla, because according to Ridgway (1908, 1909), 'Francisco Basulto [was the] collector' of USNM 209532, the holotype of *Automolus cervinigularis hypophaeus* Ridgway, 1909 (Furnariidae), collected at Guayábo on 'March 16 (not 19), 1908' (Deignan 1961: 248); and USNM 209464, the type of *Conopias albovittatus distinctus* (Ridgway, 1908) (Tyrannidae), collected on 18 March at the old Guayábo Station (i.e., not the hacienda, see below for discussion).

In the USNM ledger, all the specimens collected in 1908 during the 'Museum-Zeledon Expedition' were catalogued by Ridgway (i.e., in the same handwriting as the DMNH reprint annotations) in a single numerical series, beginning with USNM 208966 on 11 August, and ending with USNM 210594 on 19 August 1908. Notably, only ten specimens were collected in April 1908 by Ridgway and/or Zeledón. Nearly all of these are from 'San José', and none from Bonilla (Table 2). Therefore, Ridgway's seemingly dismissive and contradictory comment, that 'Basulto did not collect; he was merely our taxidermist', must have referred to the Guayábo locality—not Bonilla, despite the annotation's placement—because the opposite was true: according to primary sources, Basulto was the *only* collector at Bonilla in 1908, *contra* Carriker (1910: 336). For a discussion of the two specimens (both holotypes) reportedly collected by Basulto at Guayábo in 1908, see below. After leaving Bonilla, Basulto continued to collect on his own for the 'Museum-Zeledon Expedition' for at least one month after Ridgway returned to the USA (8 May, see Wetmore 1931), at multiple localities including 'Copey' and 'Santa Maria de Dota' (4–31 May; e.g., USNM 209873–875) and 'Laguaria' (2–9 June; e.g., USNM 209916, 210291). All of Basulto's specimens reached the USA by August 1908, when Ridgway catalogued them in the USNM ledger.

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Coliblanco

Carriker (1910: 336) wrote: 'I cannot find this word [Coliblanco] used for any locality in the vicinity where Mr. Ridgway collected, but from what he tells me … it probably lies between Santa Elena and Santa Cruz, and is on the long ridge running down from the summit of the Volcan de Turrialba in a northeasterly direction.' However, in his annotations, Ridgway clarified that '[Coliblanco] is the name of an Estate; alt. about 6500 ft. [= 1,981 m], near [the] S.E. base of Volcan de Turrialba … [between] Capalladas and Sta. Cruz … [the] ridge runs in S.E. direction'—not 'northeast' (Fig. 4). Ridgway added to his annotation, in darker ink (my italics): 'The *hacienda* of Coliblanco is on the road between Capalladas and Santa Cruz at the base of a spur of Turrialba running S.E. from the volcano, at an estimated altitude of 6500 ft.–R.R.' (Fig. 4). These annotations clarify Ridgway's (1905: 157) earlier (vaguer) statement that Coliblanco was 'an estate belonging to Don Aurelio Lopez Calleja, of Cartago [presumably a relative of Don Francisco, proprietor of Bonilla, see above], on the lower slope of a mountain near the volcano of Turrialba, at an estimated altitude of 6500 feet.' On modern maps, the name 'Coliblanco' appears on highway 230, between Capalladas and Santa Cruz (09°56′55.32″N, 83°46′27.84″W), and there is a popular waterfall near the site (Catarata del Río Turrialba). Near the road, Coliblanco is situated at *c*.5,577 ft (1,700 m).

Ridgway and Zeledón collected at 'Coliblanco' from 27 April to 8 May 1905, according to data from specimen labels (*n* = 198, C. Milensky *in litt*. 2023). This tally includes five pickled specimens (partial trunks associated with study skins) and one nest with eggs (USNM B30988). In the online sample of study skins collected at Coliblanco in 1905, which are listed in the VertNet.org database (*n* = 165), Ridgway is listed as the sole collector of 129, including USNM 199582, the holotype of *Lepidocolaptes affinis neglectus* (Ridgway, 1909) (Furnariidae); Zeledón is listed as sole collector of 34; Ridgway and Zeledón are jointly listed as collectors of one (AMNH 154105); and the collector is unknown for one (AMNH 154024).

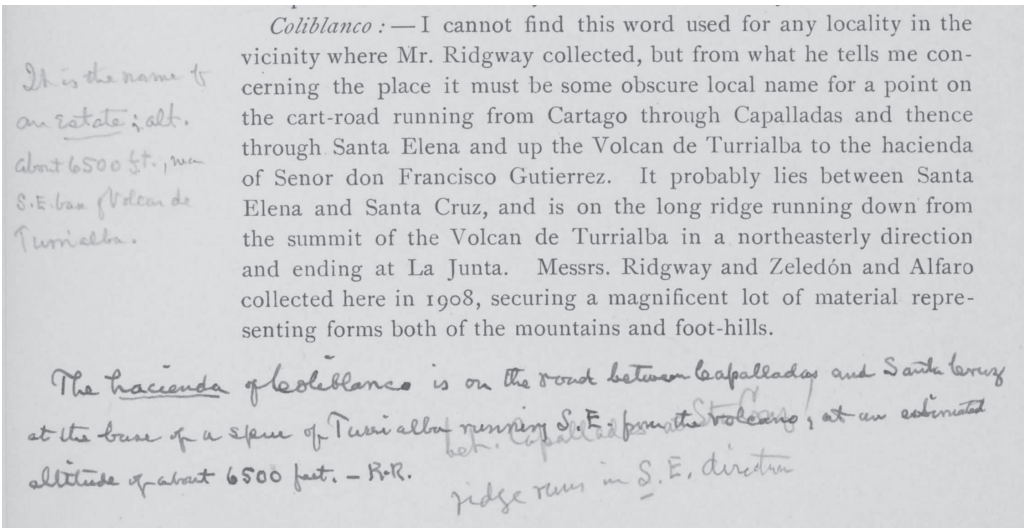

Figure 4. Ridgway's annotations to the 'Coliblanco' account in Carriker (1910); reproduced courtesy of the Delaware Museum of Nature & Science (Matthew R. Halley)

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Guayábo

Guayábo is the type locality of Zeledón's Antbird *Hafferia zeledoni* (Ridgway, 1909) (Thamnophilidae), the only new taxon described from Ridgway's expeditions to Costa Rica that is currently treated at species rank (Table 1; del Hoyo *et al*. 2020, Gill *et al*. 2023). Ridgway (1909: 74) described '*Myrmeciza zeledoni*' based on an adult male (USNM 209558) collected at Guayábo on 7 March 1908 (Deignan 1961: 256). Carriker (1910: 342) stated that Guayábo was 'A station on the railway from Port Limon to San José, between Turrialba and Juan Viñas, at an altitude of about 2500 feet' and that 'Much of the collecting [at Guayábo] was very probably done in the hills back of the station'. Ridgway confirmed the latter statement by writing 'practically all' in the margin of the DMNH reprint (Fig. 5). Ridgway again noted that the hacienda and station were two different sites with the same name (Fig. 5):

> 'The hacienda of Guayabo, where Zeledón and I collected, is on the same spur of Turrialba as Bonilla, but at a much higher altitude. Readings of an aneroid barometer (probably not accurate) gave the altitude of the house as 700 m. (about 3,267 ft.),[1] but collecting was done at elevations ranging from about 2000 to 4000 ft. [= 610–1,219 m]. The [railroad] station of Guayabo is at about 1420 feet [= 433 m] (according to the same aneroid).–R.R.'

Carriker (1910: 342) stated that Guayábo station was located 'between Turrialbla and Juan Viñas' (i.e., west of Turrialba town), which is evidently an error. Ridgway's annotation clarifies that it was 'on the same spur of Turrialba as Bonilla' (i.e., north-east of Turrialba town). Like Bonilla, no train station with the name 'Guayábo' appears on the 1903 'Sketch map of the Costa Rica railways' (Durán Segura 2018), so it may have been merely a platform without a building. The name 'Guayábo' appears frequently on modern maps for locations between the Río Guayábo and Río Lajas, on the west bank of the Río Reventazón (Fig. 2). The trestles where the old railway crossed the Río Guayábo (09°56′4.56″N, 83°38′21.48″W) and Río Lajas (09°56′35.88″N, 83°37′58.08″W) are visible in satellite imagery (Google Earth).

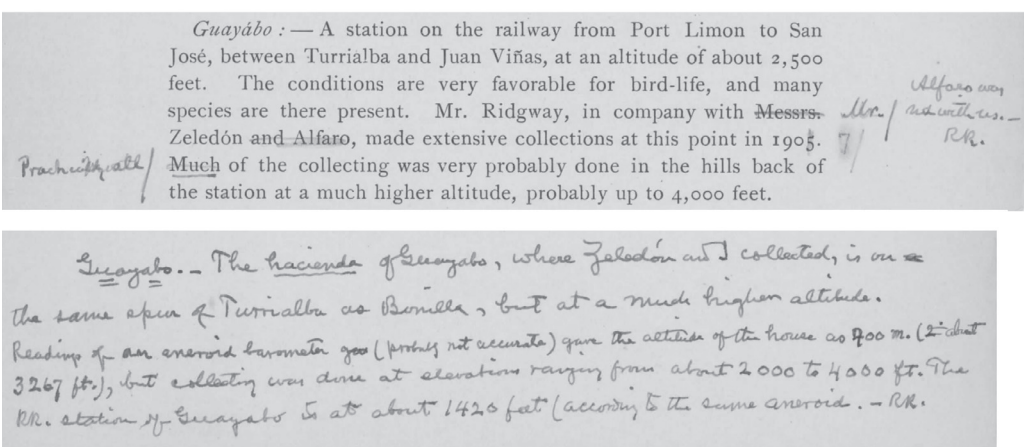

Figure 5. Ridgway's annotations to the 'Guayábo' account in Carriker (1910); reproduced courtesy of the Delaware Museum of Nature & Science (Matthew R. Halley)

[1] This value was evidently an error, as 700 m equates to approximately 2,300 ft., which is actually lower (not 'much higher') than Bonilla, which Ridgway stated was situated at 2,600 ft.

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Beyond the Río Colima, the path of the old railway is difficult to discern in satellite imagery. However, it is clearly marked in the default and 'terrain' map settings (Google Earth).

If the old Guayábo station was located in this area, then the collecting locality of Ridgway and Zeledón was probably near the town of El Guayábo (09°57′0″N, 83°39′0.36″W), north-west of the Río Reventazón, on the slopes of Volcán Turrialba, at an elevation of 600–700 m (i.e., 'in the hills back of the station'). To my knowledge, *Conopias albovittatus distinctus* (Ridgway, 1908) is the only taxon for which Guayábo station (i.e., not the hacienda) was explicitly given as the type locality. The holotype (USNM 209464) was collected at 'Guayabo' according to the USNM ledger (entered 12 August 1908) and its labels (Fig. 6), and 'Rio Reventezón (near Guayabo Station)' according to Ridgway (1908: 191). Zimmer (1935: 21) and subsequently Deignan (1961: 248) assumed that USNM 209532, the holotype of *Automolus cervinigularis hypophaeus* Ridgway, 1909, was also collected at 'Guayabo *Station*, Costa Rica' (my italics), but Ridgway (1909: 72) merely stated 'Guayabo, Costa Rica, (Rio Reventezón)' in the original description, and none of the primary sources mentioned the station (Fig. 7). Both of these holotypes also have conflicts in the 'collector' data, between primary and secondary sources (see below).

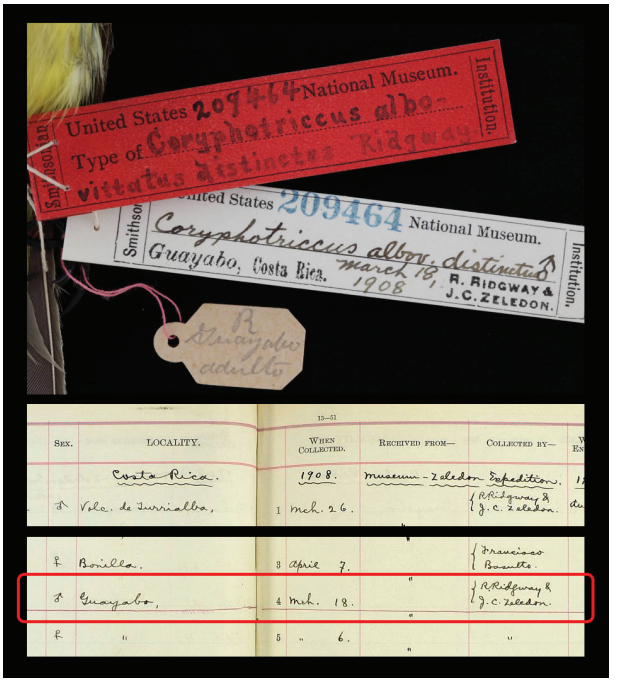

Figure 6. USNM ledger entry (bottom) and labels (top) of USNM 209464, holotype of *Conopias albovittatus distinctus* (Ridgway, 1908). Both primary sources indicate that the specimen was collected by 'R. Ridgway & J. C. Zeledon'—not Franscisco Basulto, as stated by Ridgway (1908) in the original description. Photos courtesy of the Division of Birds, National Museum of Natural History (USNM), Smithsonian Institution.

Carriker (1910: 343) wrote: 'Mr. Ridgway, in company with Messrs. Zeledón and Alfaro, made extensive collections at [Guayábo] in 1905'. In this statement, the given year was probably a typo, because Ridgway and Zeledón collected at Guayábo in 1908—not 1905. However, mention of Alfaro is more puzzling because in the DMNH reprint Ridgway stated that 'Mr. Alfaro was not with us' (Fig. 5). Was this merely an error, and Carriker (1910) meant to say 'Basulto' instead of 'Alfaro'? According to data from specimen labels (n = 418, all study skins), the expedition collected at Guayábo on 2–31 March 1908—immediately before Basulto (alone) collected at Bonilla (see above). An itinerary in the opening pages of Ridgway's field catalogue from the 1908 expedition states that they were at 'Guayabo (E. base of V. Turrialba)' on 'March 5–23, [and] March 29–April 1' (Smithsonian Institution Archives, SIA Acc. 12-468). About 93% of the study skins collected at Guayábo in 1908, based on the sample in the VertNet.org database (n = 389/418, accessed 21 August 2023), were collected by Ridgway and/or Zeledón.

As discussed above, when Ridgway stated that 'Basulto did not collect; he was merely our taxidermist' (Fig. 3), he was most likely referring to the Guayábo locality—not Bonilla,

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where Basulto alone collected in 1908 (while Ridgway and Zeledón were in San José). This is confirmed in Ridgway's field catalogue, where Basulto alone is listed as the collector at Bonilla (SIA Acc. 12-468). The two aforementioned holotypes (USNM 209464: *Conopias albovittatus distinctus*; USNM 209532: *Automolus cervinigularis hypophaeus*) are the only two specimens that Basulto is supposed to have collected at 'Guayábo', and both have problematic discrepancies between primary sources and Ridgway's (1908, 1909) published descriptions. USNM 209464 was collected by 'R. Ridgway & J. C. Zeledon' according to the USNM ledger and its white USNM label (Fig. 6), but Ridgway (1908: 191) credited 'Francisco Basulto' as the collector in the original description of *C. a. distinctus*. The original (field) label has no collector data: 'R / Guayabo / adult' (front), '272. Marzo 18 / 1908 / ♂' (verso); nor does the red type label. In the field catalogue, Ridgway did not mention the collectors at Guayábo (SIA Acc. 12-468).

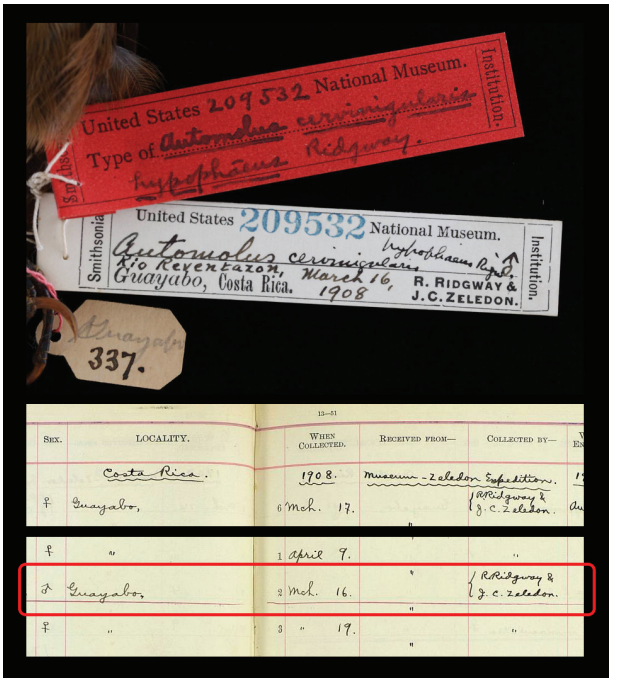

Figure 7. USNM ledger entry (bottom) and labels (top) of USNM 209532, holotype of *Automolus cervinigularis hypophaeus* Ridgway, 1909. Both primary sources indicate that the specimen was collected by 'R. Ridgway & J. C. Zeledon'—not Franscisco Basulto, as stated by Ridgway (1909) in the original description. Photos courtesy of the Division of Birds, National Museum of Natural History (USNM), Smithsonian Institution.

USNM 209532 presents a comparable situation: 'R. Ridgway & J. C. Zeledon' were credited (by Ridgway) as its collectors in the USNM ledger and on the specimen's white label (Fig. 7)—with no mention of Basulto—but 'Francisco Basulto, collector' alone was credited in the original description, with no mention of Ridgway or Zeledón (Ridgway 1909: 72). In both cases, Deignan (1961: 248, 275) apparently tried to reconcile this discrepancy by stating that the specimens were collected by 'Francisco L. Basulto, for Robert Ridgway and José C. Zeledón', but this combination is not supported by primary sources. Ridgway's annotations in the DMNH reprint offer a resolution to this problem, casting doubt on Basulto's role as the collector (*sensu stricto*): 'Basulto did not collect [at Guayábo]; he was merely our taxidermist.–R.R.' Therefore, the most parsimonious explanation is that Ridgway's (1908, 1909) published accounts (i.e., secondary accounts) were erroneous with respect to Basulto's involvement. Primary sources do not even state that Basulto was the preparator of those specimens.

Conclusion

Ridgway's annotations in the DMNH reprint draw attention to discrepancies between data in the USNM ledger and labels, and Carriker's (1910) published accounts, relevant to three Costa Rican type localities. These discrepancies affect the data of hundreds of

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specimens, including the type specimens of 11 taxa, of which nine names are currently in use (Table 1). The following five points summarise the principal findings:

1. 'Bonilla' (type locality of four taxa) was located at a hacienda—not the railway station of the same name—in the hills that rise from the west bank of the Río Bonilla, near its confluence with the Río Reventazón, at an approximate elevation of 2,600 ft. (792 m)—not '1,000 to 1,200 feet' (305–366 m) as stated by Carriker (1910: 336).
2. Basulto alone—not Ridgway and Zeledón—collected at Bonilla in 1908, *contra* Carriker (1910: 336); the latter men were concurrently (sporadically) collecting near San José.
3. 'Coliblanco' (type locality of one taxon) was located at a hacienda between Capalladas and Santa Cruz, south-east of Volcan Turrialba—not north-east as stated by Carriker (1910: 336)—at an estimated elevation of 6,500 ft. (1,981 m).
4. 'Guayábo' (type locality of five taxa including *Hafferia zeledoni*) was located at a hacienda—not the railway station of the same name—probably in the hills that rise from the west bank of the Río Reventazón, between Río Guayábo and Río Lajas—not 'between Turrialbla and Juan Viñas' as stated by Carriker (1910: 342). 'Guayábo station' was the type locality of only one taxon (*Conopias albovittatus distinctus*).
5. Basulto evidently did not collect (shoot) specimens at Guayábo in 1908; 'he was merely [a] taxidermist' (*fide* Ridgway in the DMNH reprint). This claim is supported by primary sources: the USNM ledger and specimen labels indicate that 'R. Ridgway & J. C. Zeledon' (not Basulto) collected USNM 209464 and 209532, the holotypes of *Conopias albovittatus distinctus* and *Automolus cervinigularis hypophaeus*, respectively; and Ridgway's field catalogue does not mention Basulto in connection with the Guayábo field site. These are the only two specimens that Basulto reportedly collected at 'Guayabo', according to Ridgway's (1908, 1909) publications, which were evidently in error.

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