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A new subspecies of Greater Antillean Bullfinch *Loxigilla violacea* from the Caicos Islands with notes on other populations

by Donald W. Buden

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The Turks and Caicos Islands (Fig. 1) are small (up to c. 288 km^2, Middle Caicos), predominately scrub-covered British Crown islands at the south-eastern end of the Bahama archipelago. Specimens of the Greater Antillean Bullfinch *Loxigilla violacea* that I collected on the Caicos Bank during my 1970's surveys of southern Bahaman vertebrates are noticeably smaller than those taken elsewhere in the archipelago. Measurements (mm) of specimens I examined from throughout the range of *L. violacea* (Tables 1 & 2) include wing length (flattened against the ruler), tail length (base to tip of longest rectrix), total length (tip of bill to tip of tail and on freshly-dead specimens only), bill length (exposed culmen), bill width (between lore and nostril) and bill depth (at base of exposed culmen).

Endemic to the West Indies, *L. violacea* is known from the Bahamas (includ-

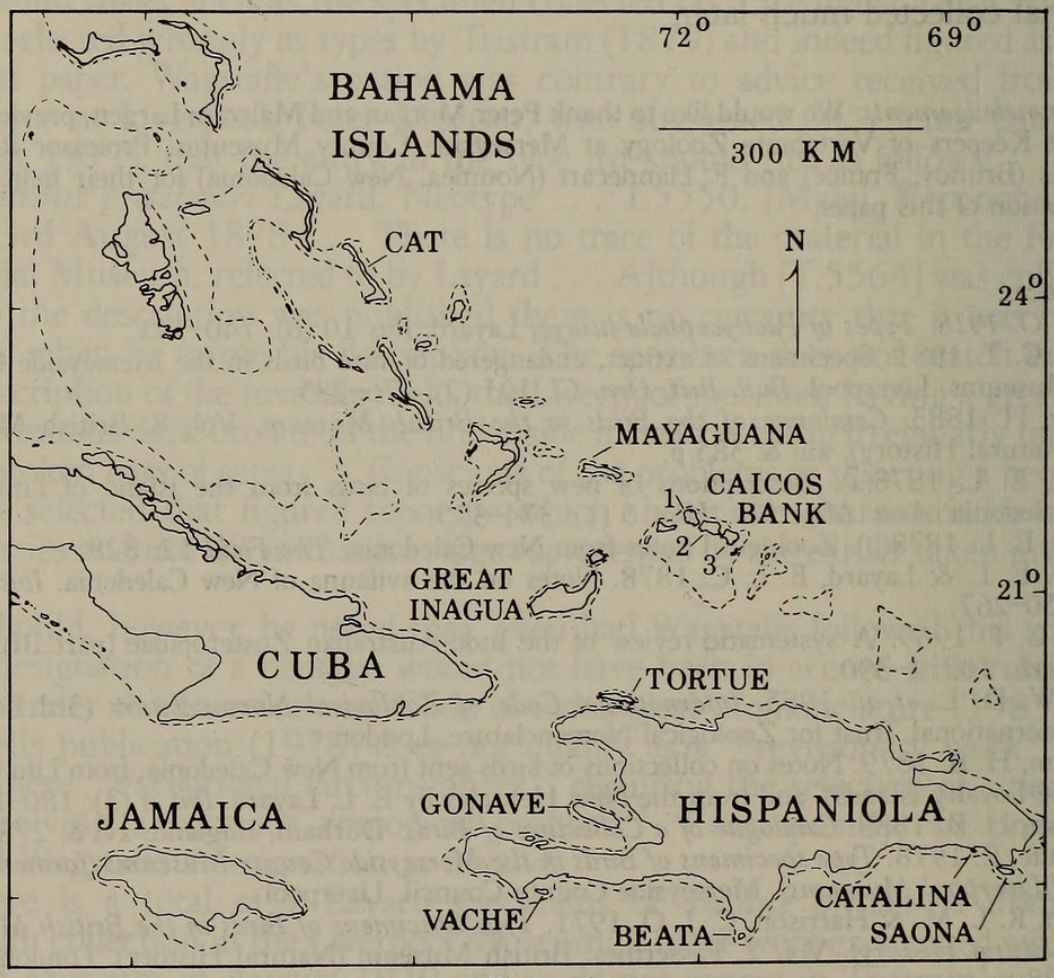

Figure 1.

TABLE 1

Mean ± 1SD, sample size and range for measurements (mm) in 6 samples of *Loxigilla violacea*. N[orthern] Bahamas specimens are from Grand Bahama, Great and Little Abaco, the Berry Islands, Andros, New Providence, Eleuthera and Cat Island.

Characters	N Bahamas	Great Inagua	Caicos Islands	Hispaniola	Jamaica
			MALES		
Wing length	77.4±2.0 (50) 72.0-82.0	74.4±2.5 (9) 72.0-79.0	73.3±1.8 (8) 71.0-77.0	75.8±2.2 (46) 69.0-80.0	82.1±2.0 (17) 79.0-86.0
Tail length	66.8±2.6 (62) 62.1-74.5	62.8±2.7 (19) 58.6-66.7	62.0±2.5 (8) 57.9-65.3	65.2±2.7 (46) 60.6-71.1	68.6±2.2 (19) 64.7-73.8
Total length	159.8±5.4 (11) 153.0-172.0	153.0±2.7 (3) 150.0-155.0	148.8±5.5 (8) 141.0-155.0	156.3±5.9 (34) 140.0-168.0	— —
Bill length	14.3±0.7 (62) 12.2-16.3	14.6±0.9 (21) 13.2-16.5	14.6±0.5 (8) 13.9-15.3	14.0±0.8 (46) 11.8-15.7	14.9±0.6 (19) 13.6-15.7
Bill width	7.7±0.4 (65) 7.0-8.7	7.8±0.6 (21) 6.6-9.0	7.3±0.4 (8) 6.8-7.9	7.6±0.3 (46) 6.8-8.5	8.2±0.2 (19) 7.9-8.6
Bill depth	11.7±0.8 (33) 9.8-13.1	11.8±1.2 (9) 10.0-13.8	11.4±0.3 (8) 10.9-11.8	10.5±1.0 (25) 8.1-12.5	11.8±0.6 (15) 10.7-12.8
			FEMALES		
Wing length	73.1±2.2 (18) 70.0-79.0	71.5±0.7 (2) 71.0-72.0	67.8±0.9 (8) 66.0-69.0	72.0±2.4 (22) 68.0-77.0	78.2±3.5 (6) 75.0-84.0
Tail length	62.2±2.0 (19) 57.6-66.0	60.8±4.1 (12) 54.4-67.0	56.5±1.2 (9) 54.8-59.0	61.3±2.3 (21) 56.1-65.3	66.5±3.4 (6) 61.4-71.7
Total length	147.7±11.0 (3) 135.0-155.0	142.0 (1) —	138.9±5.6 (8) 128.0-147.0	152.2±6.8 (10) 142.0-164.0	— —
Bill length	13.2±0.7 (20) 12.0-14.5	14.2±1.0 (13) 13.2-16.0	12.6±0.5 (9) 12.0-13.3	12.6±0.8 (22) 11.2-14.9	13.9±1.0 (6) 12.8-15.5
Bill width	7.0±0.2 (20) 6.6-7.5	7.7±0.8 (12) 7.0-9.0	6.6±0.3 (9) 6.2-7.0	6.8±0.4 (22) 6.3-7.9	7.6±0.7 (6) 7.1-8.8
Bill depth	10.6±0.2 (12) 10.2-11.0	12.1±1.4 (8) 10.0-13.4	9.7±0.4 (7) 9.4-10.4	9.3±0.8 (14) 8.4-11.6	10.8±1.0 (6) 9.9-12.3

ing Caicos Islands), Hispaniola and many of its satellite islands and Jamaica. The names and ranges of the subspecies reported by Bond (1956) are: nominate *violacea* (Linnaeus), Bahamas; *ruficollis* (Gmelin), Jamaica; *affinis* (Ridgway), Hispaniola and Ile de la Gonâve and Isla Saona (off the western and southern coasts of Hispaniola, respectively); *maurella* Wetmore, Ile de la Tortue (off the northern coast of Hispaniola); *parishi* Wetmore, Ile-à-Vache, Isla Beata and Isla Catalina (off the southwestern, south-central and southeastern coasts of Hispaniola, respectively).

The Catalina population was reassigned to *affinis* by Schwartz & Klinikowski (1965); Bond (1969) concurred. Bond (*fide* Paynter 1970) indicated that specimens from Saona, Gonâve and Tortue were indistinguishable from each other and Paynter (1970) elected to include all of them under *maurella*. However, as the only specimens from Tortue are larger (at least in wing length) than those taken elsewhere in the Hispaniolan region, I consider *maurella* endemic to Tortue. Faaborg (1980) found no appreciable differences between *L. violacea* from Saona and the adjacent part of Hispaniola (specimens captured, measured and released), but he reported that individuals from Beata averaged slightly larger in body weight and wing length than did those from an adjacent area of Hispaniola and that both samples averaged smaller than those from Saona and southeastern Hispaniola.

TABLE 2

Mean, range and sample size for wing and tail length measurements (mm) of *Loxigilla violacea* from satellite islands off the coast of Hispaniola.

	MALES				FEMALES			
	Wing		Tail		Wing		Tail	
Locality		n		n		n		n
Tortue	83.8 (82.0-84.0)	3	69.3 (67.7-70.1)	3	80.0 ( )	1	64.7 ( )	1
Gonâve	78.1 (75.0-81.0)	9	64.9 (61.9-67.3)	8	73.8 (73.0-74.0)	4	60.5 (59.5-61.4)	3
Ile-à-Vache	74.2 (72.0-76.0)	6	64.7 (61.4-67.2)	6	68.0 ( )	1	57.0 ( )	1
Beata	73.5 (72.0-75.0)	4	58.3 (54.9-60.8)	4	71.0 (70.0-72.0)	2	58.6 (58.0-59.1)	2
Catalina	80.0 ( )	1	65.9 ( )	1	74.0 ( )	1	63.2 ( )	1
Saona	80.0 ( )	2	69.6 (69.4-69.8)	2	—		—	

Figure 1. Map of Southern Bahamas showing principal islands mentioned in the text.

Figure 1. 1 = North Caicos, 2 = Middle Caicos, 3 = East Caicos.

L.v. parishi supposedly is distinguished from all the other subspecies by its smaller size (Wetmore 1931), but this is not confirmed by any measurements of topotypes from Ile-à-Vache. In the absence of demonstrated chromatic or mensural differences between specimens from Vache and Hispaniola, I merge *parishi* with *affinis,* as did Bond (1940) in the first edition of his check-list. Specimens from Beata, however, average slightly smaller than those from Hispaniola generally and the 4 males from Beata average smaller than 6 from Pedernales Province on the adjacent Hispaniolan mainland (wing length 74-78 mm, av. 76.3; tail length 63.2-71.1, av. 67.1). Also, 2 immatures from Beata (USNM 327956, 327960) are paler grey and have more white on the venter than do those from Hispaniola; they more closely resemble examples from the Bahamas. Additional material may show the Beata population to be distinguishable subspecifically, but I tentatively include it under *affinis.* I thus recognise only 2 subspecies in the Hispaniolan region, namely *maurella* on Tortue and *affinis* elsewhere.

The subspecies of *L. violacea* are distinguished both by average differences in size (evidenced mainly by wing and tail measurements) and depth of coloration. The largest birds are from Jamaica (*ruficollis*) and Tortue (*maurella*). The Tortue birds are lustrous black, whereas those from Jamaica are dull greyish-black. Chestnut markings on the head tend to be slightly paler in Jamaican birds than in those from other islands and the immatures from Jamaica are darker (more olive above and below, less grey or greyish-white below) than those from elsewhere. Specimens from Hispaniola (*affinis*) average smaller than Bahaman (*sensu stricto*) birds (*violacea*). Immatures from the Bahamas tend to be paler (with less olive and more grey above and more grey or greyish-white below) than those from Hispaniola; Bahaman adults (especially males) tend to be less glossy than Hispaniolan adults. Specimens from Great Inagua, at the southern end of the Bahama chain, are assigned to *violacea* although they tend to have smaller wing and tail measurements than do specimens from the more northern islands. One immature from Inagua chromatically resembles specimens from Hispaniola, another is intermediate between Hispaniolan and northern Bahama specimens. Variation in size among Bahaman birds is not clinal; the largest are from Cat Island, in the east-central part of the archipelago.

The Caicos Islands have been included in the range of the nominate race by

previous authors apparently on geographic grounds and based on one *L. violacea* taken in 1891 (see below). In most measurements, however, Caicos birds average smaller than those from all adjacent areas and I propose they be assigned to a new subspecies:

Loxigilla violacea ofella subsp. nov.

Holotype. LSUMZ 81554; adult male; Jacksonville, East Caicos, Turks and Caicos Islands; collected 8 March 1976 by D. W. Buden.

Diagnosis. Smallest of the subspecies of *L. violacea* and most readily distinguished from them by its smaller wing length measurement – most marked between females in the cases of nominate *violacea* and of *affinis.* In wing length, 8 females of *ofella* (66.0-69.0 mm) are separated completely from 20 females of *violacea* from throughout the Bahamas (70.0-79.0) and overlap but narrowly with 22 of *affinis* from Hispaniola (68.0-78.0); no specimen of *ofella* (of either sex) measures as large as the smallest *maurella* or *ruficollis.* Adults of *ofella* are less glossy than those of *maurella* and (at least when adequate series are compared) most *affinis* from Hispaniola.

Range. Known definitely only from Middle and East Caicos islands in the Turks and Caicos Islands in the extreme southeastern part of the Bahama archipelago.

Etymology. Latin, *ofella,* a little piece of meat, a cutlet, a bit or morsel, in reference to the small size of individuals comprising this subspecies; a noun in apposition.

Specimens examined.

L.v. violacea, 87♂♂, 37♀♀, 2 unsexed. Bahama Islands: Grand Bahama 1♂ (MCZ); Great and Little Abaco 1♂ 1♀ (AMNH), 3♂♂ 1♀ (AS), 2♂♂ 1♀ (UNSM); Berry Islands 5♂♂ (FMNH); Andros Island 6♂♂ 1♀ (AS), 1♀ (MCZ), 1♂ (USNM); New Providence 5♂♂ (AMNH), 1♀ (AS), 1♂ (LSUMZ), 14♂♂ 4♀♀ (MCZ), 1♂ (UF), 9♂♂ 2♀♀ 1? (USNM); Eleuthera 2♂♂ (AS), 6♂♂ 1♀ (FMNH), 1♂ (MCZ), 2♂♂ 3♀♀ 1? (USNM); Cat Island 5♂♂ 4♀♀ (USNM); Highborne Cay 1♀ (MCZ); Anna's Tract, off Great Exuma 1♀ (MCZ); Crooked Island 2♀♀ (LSUMZ); Acklins Island 1♂ 1♀ (USNM); Great Inagua 2♂♂ 1♀ (AS), 12♂♂ 11♀♀ (FMNH), 1♂ (LSUMZ), 2♂♂ (MCZ), 4♂♂ (USMN).

L.v. ofella, 8♂♂, 9♀♀. Caicos Islands: Middle Caicos 2♂♂ 3♀♀ (LSUMZ), East Caicos 6♂♂ 5♀♀ (LSUMZ); unspecified locality 1♀ (FMNH).

L.v. affinis, 71♂♂, 31♀♀. Hispaniola: República Dominicana 36♂♂ 8♀♀ (AS), 3♂♂ 2♀♀ (MCZ); Haiti 1♂ 3♀♀ (AS), 7♂♂ 8♀♀ (USNM), 2♂♂ 2♀♀ (YPM). Ile de la Gonâve: 1♂ (AS), 7♂♂ 3♀♀ (USNM), 1♂ 1♀ (YPM). Isla Saona: 2♂♂ (AS). Isla Catalina: 1♂ 1♀ (AS). Isla Beata: 1♂ (AS), 3♂♂ 2♀♀ (USNM). Ile-à-Vache: 3♂♂ (AS), 3♂♂ 1♀ (USNM).

L.v. maurella, 3♂♂ 1♀. Ile de la Tortue: 1♂ (MCZ), 2♂♂ 1♀ (USNM).

L.v. ruficollis, 19♂♂, 6♀♀. Jamaica: 2♂♂ 2♀♀ (AS), 17♂♂ 4♀♀ (MCZ).

Immatures not included above were used in some of the colour comparisons.

Remarks. Loxigilla violacea is a fairly common resident in scrub and woodlands in the Bahamas, whence reported from Grand Bahama, Abaco, Bimini, the Berry Islands, Andros, New Providence, Hog Island (= Paradise Island), Eleuthera, Harbour Island, Cat Island, Highborne Cay, Exuma (= Great Exuma?), Long Island, Acklins Island, Mayaguana (but see below), the Caicos Islands and Great Inagua (Bond 1956, 1957, 1966). To this list

may be added Crooked Island (2♀♀, LSUMZ, collected 8 & 10 April 1972) and Little Inagua (sight record, 13-15 March 1976 – M. H. Clench).

Cory (1892a) included Mayaguana among the islands whence *L. violacea* had been taken by Winch in 1891. Although most of Winch's southern Bahaman material now is at the Field Museum of Natural History, Chicago (FMNH), neither I nor Dianne Maurer of the museum staff found any specimens of *L. violacea* from Mayaguana there, nor entries for any in either the FMNH catalogue or Cory's personal catalogue. I spent 29 days on Mayaguana (7-14 May 1972, 29 September to 19 October 1976) without seeing a bullfinch and Bartsch (unpublished notes, USNM archives) did not include *L. violacea* among the birds seen there 19-22 July 1930. In the absence of any substantial evidence proving that *L. violacea* inhabits or inhabited Mayaguana I consider reports of its presence there questionable.

Cory (1892b) reported *L. violacea* on North, Middle and East Caicos islands. I found only one specimen from the Caicos Islands (no other locality given) in the FMNH and only one was listed by Hellmayr (1938). That I saw no bullfinches on North Caicos during visits totalling 42 days during the 1970's and that M. H. Clench did not see any there during 10 days in February 1978 is surprising, as this island is separated from Middle Caicos by a channel only several hundred to 1000 m wide. *L. violacea* would be expected on North Caicos on grounds of proximity to thriving populations and the availability of apparently suitable habitat, but in the absence of conclusive documentation I treat Cory's record as questionable.

Chapman (1891) concluded that most species of birds in the Bahamas are of relatively recent origin from Antillean populations and that Cuba has been the source of most of them. Bond (1948) stated there is no conclusive evidence to support a claim for Hispaniolan origin of any species of bird resident in the Bahamas, having previously suggested (Bond 1939) that Bahaman populations of *L. violacea* may have been derived from a Cuban population that has since been extirpated. However, morphological similarities between *L. violacea* from the southernmost Bahamas and Hispaniola together with the geographic proximity of these islands to each other lend support to the hypothesis of a Hispaniola to Bahamas route of colonization for this species. If *L. violacea* inhabited Cuba at one time, as Bond (1939) suggested, the possibility of a bipartite invasion of the Bahamas also would have to be considered – the northern islands colonized from Cuba and the southern islands colonized from Hispaniola. In any event, *L. violacea* in the Caicos Islands are mensurally, on the average, more similar to those of Hispaniola than to those from the more northern islands. They most closely resemble examples of *affinis* from Beata. That the Caicos Islands and Beata (off northern and southern coasts of Hispaniola, respectively) are small and xeric may have contributed to convergence in the size of *L. violacea* there.

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References:

Bond, J. 1939. Notes on birds from the West Indies and other Caribbean islands. *Notulae Naturae, Acad. Nat. Sci. Philadelphia* 13: 1–6.
— 1940. *Check-list of Birds of the West Indies.* Acad. Nat. Sci. Philadelphia.
— 1948. Origin of the bird fauna of the West Indies. *Wilson Bull.* 60: 207–229.
— 1956. *Check-list of Birds of the West Indies.* 4th edition. Acad. Nat. Sci. Philadelphia.
— 1957, 1966, and 1969. Supplements 2, 11 and 14 respectively to the *Check-list of Birds of the West Indies* (1956). Acad. Nat. Sci. Philadelphia.
Chapman, F. M. 1891. The origin of the avifauna of the Bahamas. *Amer. Nat.* 25: 528–539.
Cory, C. B. 1892a. A list of birds taken on Maraguana, Watling's Island, and Inagua, Bahamas, during July, August, September and October, 1891. *Auk* 9: 48–49.
— 1892b. *Catalogue of West Indian Birds.* Privately published by the author. Alfred Mudge & Son.
Faaborg, J. 1980. The land birds of Saona and Beata islands, Dominican Republic. *Carib. J. Sci.* 15 (3–4): 13–19.
Hellmayr, C. E. 1938. Catalogue of birds of the Americas. *Field Mus. Nat. Hist. Zool. Ser.* Vol. 13, Pt. 11.
Paynter, R. A. Jr. 1970. Subfamily Emberizinae. Pp. 3–214 *in* R. A. Paynter, Jr (ed.). *Check-list of Birds of the World.* Vol. 13. Museum of Comparative Zoology, Harvard Univ.
Schwartz, A. & Klinikowski, R. F. 1965. Additional observations on West Indian birds. *Notulae Naturae, Acad. Nat. Sci. Philadelphia* 376: 1–16.
Wetmore, A. 1931. The bullfinch of Île à Vache, Haiti. *Proc. Biol. Soc. Washington* 44: 27–28.

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Catamblyrhynchus and *Paradoxornis:* an unremarked instance of convergence in bill morphology for feeding on bamboo

by Storrs L. Olson

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Regular work in a major museum inevitably results in serendipitous discoveries which there may be no opportunity to investigate in detail. The following observations report one such revelation and are offered in the hope that they will stimulate further research.

The Plush-capped Finch *Catamblyrhynchus diadema* is a peculiar member of the New World 9-primaried oscines (Fringillidae in its broadest sense) that occurs in the Andes of South America from Venezuela to Bolivia. Its more precise relationships have remained obscure and it was long carried in its own family, Catamblyrhynchidae, thought to be allied to the tanagers (Thraupidae *auct.*). It is characterized by a distinctive, short, wedge-like bill with a flattened culmen, and a bright yellow cap of plush, bristly feathers. Almost nothing was known of the habits of *Catamblyrhynchus* until Hilty *et al.* (1979) showed it to be strongly associated with stands of bamboo, in which the birds "forage on bamboo stalks by clinging upright, vertically, or upside down, adopting these chickadee (*Parus*)-like postures with versatility. They press their short swollen bill directly into the axiles of dense leaf whorls at each node, sometimes tugging