

GEOGRAPHIC VARIATION IN THE YELLOW
WARBLERS (*DENDROICA PETECHIA*: PARULIDAE)
OF THE PACIFIC COAST OF MIDDLE
AND SOUTH AMERICA

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Abstract.—Three new subspecies of *Dendroica petechia* are described from Panamá and Colombia and the characters and distribution of related forms from the Pacific coast are discussed. *D. p. aithocorys* n. subsp. occurs on the Pacific coast of western Panamá. *D. p. iguanae* n. subsp. is confined to tiny Isla Iguana off the Azuero Peninsula, Panamá. *D. p. jubaris* n. subsp. occurs from Darién, Panamá, to Buenaventura, Colombia, and specimens cited herein are the first to be identified from the Pacific coast of Colombia north of Nariño.

The Yellow Warbler, *Dendroica petechia*, comprises three groups of subspecies that were once considered separate species: the migratory *aestiva* group (Yellow Warbler), which is widely Nearctic in distribution; the *petechia* group (Golden Warbler) of the West Indies, Isla Cozumel, and most of coastal Venezuela; and the *erithachorides* group (Mangrove Warbler) on both coasts of Middle America and South America to Peru on the Pacific side, including the Galápagos and Cocos Island and to the Paraguaná Peninsula of Venezuela on the Atlantic side. Except on certain islands, birds of the *petechia* and *erithachorides* groups are usually confined to coastal mangrove swamps.

Hellmayr (1935) considered the *erithachorides* and *petechia* groups to constitute one species and maintained the *aestiva* group as a separate species based on differences in the proportions of the wing and tail. Aldrich (1942) discussed the systematics of these birds and concluded that *petechia* and *aestiva* were conspecific. In most recent works (e.g. Lowery and Monroe, 1968), all three groups are considered to belong to a single species, *Dendroica petechia*.

Large series of previously unidentified specimens of the resident populations from Panamá and Colombia permit the recognition of three additional subspecies in the *erithachorides* group. All the specimens examined in this study are in the collections of the National Museum of Natural History, Smithsonian Institution (USNM), except those of *D. p. peruviana*, which were borrowed from the American Museum of Natural History, New York.

Dendroica petechia xanthotera Todd

Dendroica bryanti xanthotera Todd, 1924, Proc. Biol. Soc. Wash. 37:123.
Puntarenas, Costa Rica.

Characters.—Males with chestnut coloration on head dark, restricted on lower parts to chin and throat; ventral streaks narrow; females with ventral streaks narrow and generally confined to the throat or only faintly indicated on upper breast.

Range.—Pacific coast of Central America from Guatemala to Costa Rica.

Specimens examined.—GUATEMALA: San José (2); HONDURAS: San Lorenzo (1); COSTA RICA: Puntarenas (1); Pigres (24).

Remarks.—This subspecies is not known from Panamá although Wetmore (1957) had tentatively listed birds of the following subspecies under this name. Hellmayr (1935:381) referred specimens in the Field Museum from "Punta Mala," Costa Rica to *xanthotera*. Wetmore (unpublished notes) examined these in 1960 and found them to have been collected by G. K. Cherrie at Punta Mala, Río Diquis (=Río Terraba). This he then considered to be the southernmost record of *xanthotera*.

Dendroica petechia aithocorys, new subspecies

Holotype.—USNM 400752, adult male, from 5 miles east of La Honda, near Los Santos, Los Santos Province, Panamá; collected 15 March 1948 by Alexander Wetmore and W. B. Perrygo (original number 13861).

Characters.—Compared to *xanthotera*, male with chestnut portions somewhat lighter in color, hood much more extensive, including the upper breast; ventral streaks markedly wider and more profuse; female with throat and breast much more heavily streaked with chestnut. Compared to *aequatorialis* of Panamá Province, males with chestnut portions darker, upper breast not streaked with yellow; females of both races variable but *aithocorys* generally with more chestnut below than *aequatorialis*. Similar to *erithachorides* but males with chestnut hood and streaks somewhat more extensive, yellow of underparts brighter, more golden.

Range.—Pacific coast of western Panamá from at least as far west as Puerto Armuelles, Chiriquí, east as far as Puerto Aguadulce, Coclé, and including Isla Coiba and the coasts of the Azuero Peninsula.

Specimens examined.—CHIRIQUÍ: Puerto Armuelles, Olivo (3); Alanje, Estero Rico (2); VERAGUAS: Puerto Vidal, Río Vidal, Isla Corocita (3); Islas Contreras, Isla Brincanco (8); Isla Coiba (15); Puerto Mutís, Isla Verde, mouth of Río San Pedro (5); LOS SANTOS: Pedasí, Bajadero (1); Tonosí, Puerto Piña (2); Los Santos, 5 miles E of La Honda (6); HERRERA: Monagrillo, Río Parita (1); Paris, 4 miles NE of Alvina (19); COCLÉ: Aguadulce (4); Puerto Aguadulce, Río Pocrí (8).

Etymology.—Greek, *aithos*, burnt, reddish-brown, and *korys*, helmet, in reference to the extensive chestnut-colored hood of this subspecies.

Remarks.—Wetmore (1957:90) clearly recognized that this population differed from *aequatorialis* to the east, but tentatively referred it to *xanthotera* pending the collection of specimens from Chiriquí. Although he stated that these birds were “intermediate between *aequatorialis* and *xanthotera*,” and they were so regarded by Lowery and Monroe (1968), this is true only in that the chestnut portions approach *xanthotera* in being darker. Otherwise, the relationships of *aithocorys* are much closer to *aequatorialis*. In the greater extent of chestnut on the throat and upper breast, *aithocorys* is equalled only by *chrysendeta* Wetmore, of the Guajira Peninsula in Colombia. It differs from *chrysendeta* in being less heavily streaked below and in having less yellow in the secondary coverts.

As Wetmore (1957) noted, *aequatorialis* occurs west as far as western Panamá Province, so that intergradation with *aithocorys* could be expected to take place along the coast of Coclé. Indeed, some of the specimens from the Aguadulce area show a bit more yellow in the upper breast than typical *aithocorys*.

Dendroica petechia subsp.

Characters.—Plumage like *aithocorys* but size evidently larger.

Range.—Isla Bolaños and possibly Isla Parida, Chiriquí, Panamá (about 45 km SE of David).

Specimens examined.—One male and two females collected on Isla Bolaños in February 1963 by Alexander Wetmore.

Remarks.—These are the only specimens of Yellow Warbler that Wetmore collected on Isla Bolaños. His field notes record that he saw the species on adjacent Isla Parida, but he was unsuccessful in his attempts to collect it there. The male is notably larger (wing chord 70.2 mm) than any of 30 males of *aithocorys* (wing chord 62.3–68.1, mean 64.9). The two females (wing chord 66.0 and 63.7) are near the upper limits of *aithocorys* (wing chord 59.4–66.4, mean 61.8, $n = 30$). Without additional material it cannot be determined that this population merits nomenclatural recognition.

Dendroica petechia iguanae, new subspecies

Holotype.—USNM 462360, adult male from Isla Iguana, Los Santos Province, Panamá. Collected 27 February 1957 by Alexander Wetmore (original number 21338).

Characters.—Males nearest *aithocorys* but chestnut of head much darker, less rufescent; green of dorsum darker, less yellowish; breast and particularly the lower belly more densely streaked with chestnut; yellow of

underparts and tail darker, appearing dingy and greenish. Females like *aithocorys* but tending to be more heavily streaked, yellow of underparts dingier as in the males.

Range.—Confined to Isla Iguana, about 7 km ENE of Pedasí and 18 km N of Punta Mala, Los Santos Province, eastern coast of Azuero Peninsula, Panamá (7°38'N; 80°W).

Specimens examined.—Holotype; 6 male and 6 female topotypes with the same data except that two of the males were collected the previous day.

Etymology.—Named for the type locality, Isla Iguana.

Remarks.—Isla Iguana is a small island, probably less than 1 km², lying approximately 6 km from the mainland. It is the only island along the eastern and southern coasts of the Azuero Peninsula. Considering that, with the possible exception of the birds from Isla Bolaños, none of the island populations of Yellow Warblers in Panamá have differentiated from those of the mainland, it is rather surprising to find that those of Isla Iguana are so distinct. Even in the field, Wetmore (field journal) noted the more greenish coloration of these birds.

The fauna of Isla Iguana is dominated by a great nesting colony of magnificent Frigatebirds (*Fregata magnificens*) interspersed with Brown Pelicans (*Pelecanus occidentalis*). According to Wetmore's field journal, *Dendroica petechia* "was the only abundant small bird on the island, where it ranged everywhere, from the tall bunch grass above the rocky shore to the scrub forest inland. I saw them hopping about on bare rocks above high tide mark in early morning, and fifteen or twenty ranged about the outdoor kitchen near the house, where they came out familiarly in low perches, as well as higher among the leaves of the trees. In the forest I found them often examining tufts of leaves almost among the frigate-birds perched in the branches. Many were in pairs, and males sang occasionally, though they were not breeding."

The only other land birds Wetmore collected on the island were three specimens each of two species of tyrannid flycatchers (*Myiarchus panamensis* and *Sublegatus arenarum*) and one specimen each of two species of hummingbirds (*Chlorostilbon assimilis* and *Lepidopyga caeruleogularis*). In addition he sighted two hawks that he thought probably were *Buteogallus anthracinus*.

Dendroica petechia aequatorialis Sundevall

Dendroica petechia aequatorialis Sundevall, 1870, Ofvers. Vetensk.-Akad. Förhandl. 26:609. "Guayaquil" = Panamá City (cf. Peters, 1931, Bull. Mus. Comp. Zool., 71:334).

Characters.—Male with crown, cheeks, and throat uniform chestnut but of a lighter shade than in *aithocorys*, upper breast streaked with yellow.

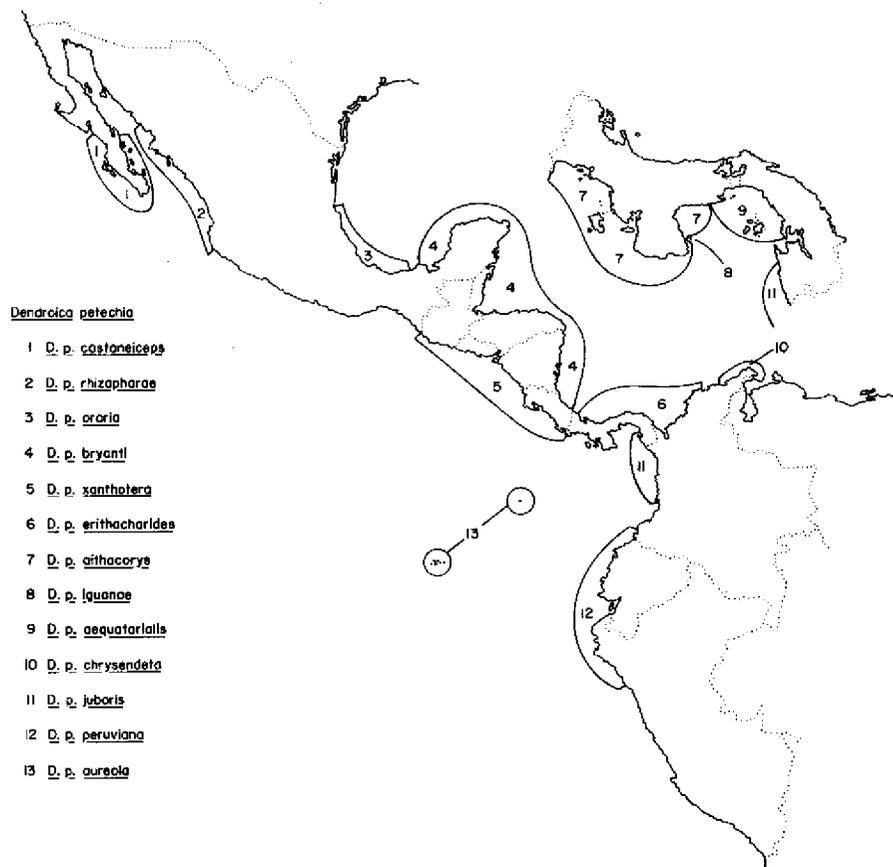


Fig. 1. Outline of map of Middle America and adjacent South America showing the approximate known distribution of the subspecies of the *erithachorides* group of *Dendroica petechia*. Inset shows detail of the distribution of Panamanian subspecies. *D. p. paraguanae* of Venezuela omitted.

Range.—Pacific coast of the Province of Panamá and the Archipiélago de las Perlas.

Specimens examined.—PANAMÁ PROVINCE: Bejuco, Puerto El Tigre (11); Taboguilla Island (8); “near Panama City” (1); Chico, mouth of Río Chico (12); Majé, mouth of Río Majé (10); CANAL ZONE: Farfan Beach (3); Corozal (3). ARCHIPIÉLAGO DE LAS PERLAS: Isla San José (20); Isla Moreno (4); Isla Pedro Gonzalez (3); Isla San Miguel (5); Isla Saboga (1); Isla Chapera (4); Isla Santelmo (3); Isla Bayoneta (5); Isleta Málaga (2).

Remarks.—There is a greater amount of individual variation in this subspecies than in any of the preceding. Thayer and Bangs (1905) and Wetmore (1946) have remarked on the occasional individuals from the Archipiélago

de las Perlas that have the yellow portions of the plumage replaced with orange, of which there are two in the USNM series from Isla San José. Some of the adult males from Majé show traces of yellow in the cheeks, perhaps an indication of intergradation with the following subspecies.

Dendroica petechia jubaris, new subspecies

Holotype.—USNM 443695, adult male from Nuquí, Dept. Chocó, Colombia (5°40'N). Collected 22 January 1951 by M. A. Carriker, Jr. (original number 19284).

Characters.—Compared with *aequatorialis*, males with chestnut portions of plumage lighter, more tawny; throat and chin either suffused with, or distinctly streaked with yellow; cheeks and lores suffused with yellowish, contrasting with the darker crown, so that the birds appear distinctly capped, as opposed to *aequatorialis* in which the entire head is chestnut; belly less streaked with chestnut, appearing more brightly yellow. Closest to *peruviana*, but cheeks, lores, and chin of males, tawny chestnut, less yellow; females more heavily streaked with chestnut below.

Range.—Panamá in Darién, south along the Pacific Coast of Chocó, Colombia, at least to Buenaventura, Valle del Cauca.

Specimens examined.—PANAMÁ: DARIÉN: Jaqué (15); COLOMBIA: CHOCÓ: Nuquí (10); VALLE DEL CAUCA: Buenaventura (1).

Etymology.—Latin, *jubar*, radiance of the heavenly bodies, light, sunshine; so named for the brilliance of the yellow plumage.

Remarks.—No resident form of *Dendroica petechia* has heretofore been identified from the Pacific coast of Colombia north of Tumaco, Nariño. The specimen listed above from Buenaventura was collected in 1864 by Hicks and cataloged in the USNM collections in 1878 but seems never to have found its way into the literature. This had been identified as *peruviana* by Wetmore, but probably in the absence of comparative material, as the USNM still lacks representatives of this subspecies.

Dendroica petechia peruviana Sundevall

Dendroica petechia peruviana Sundevall, 1870, Ofvers. Vetensk.-Akad. Förhandl. 26:609. Callao, Peru.

Characters.—Males like *jubaris* but with cheeks, lores and chin more yellowish, less suffused with tawny chestnut; females with chestnut streaks of underparts obsolete, nearly absent. Males of *D. p. aureola* Gould of the Galapagos and Cocos Island differ in having only the cap chestnut, with the sides of head, chin, and throat yellow, and the ventral streaks generally less prevalent, particularly on the lower throat.

Range.—Known from Tumaco, Dept. Nariño, Colombia, south through coastal Ecuador to northern Peru, at least as far south as Tumbes.

Specimens examined.—COLOMBIA: NARIÑO: Tumaco (2); ECUADOR: ESMERALDAS: Esmeraldas (2); EL ORO: Isla de Jambelí (2).

Remarks.—This subspecies shows some variation in the extent of chestnut on the sides of the head and throat, so that occasional intensely colored individuals would probably be difficult to separate from the lightest individuals of *jubaris*. Over 300 km separate the known northern limits of *peruviana* at Tumaco from the southern limits of *jubaris*, as represented by the single old specimen from Buenaventura.

Discussion

Some peculiar patterns of distribution in the *erithachorides* group deserve to be called to attention. The subspecies from the Pacific coast of Costa Rica northward (*xanthotera*, *rhizophorae*, *castaneiceps*) and those of the Atlantic side of Costa Rica northward (*bryanti*, *oraria*) are more similar to one another than any of these subspecies are to those along either coast of Panamá (Fig. 1). These northern birds could be designated as the "bryanti subgroup," characterized by having the chestnut of the throat more restricted and the ventral streaks narrower and sparser. Birds from the Pacific coast of Panamá (*aithocorys*, *iguanae*, *aequatorialis*) are more similar to those of the Atlantic coast of Panamá and South America (*erithachorides*, *chrysendeta*, *paraguanae*) than to the *bryanti* subgroup. These could be designated as the "erithachorides subgroup," characterized by the more extensive hood, and wider, more profuse ventral streaks.

The chestnut-capped birds from the Galápagos and Cocos Island (*aureola*) appear to be more similar to some of the subspecies in the West Indian *petechia* group than to the adjacent *erithachorides* group. However, through the progression *aithocorys-aequatorialis-jubaris-peruviana*, along the mainland, *aureola* could be viewed as the endpoint in a southward increase of yellow on the head and cheeks, in which case its similarities to West Indian subspecies would have evolved independently.

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