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## A REVISION OF THE GEOGRAPHICAL RACES OF THE BLUE GROSBEAK (*GUIRACA CÆRULEA*)

BY JONATHAN DWIGHT AND LUDLOW GRISCOM

In looking over some Blue Grosbeaks from western Costa Rica and Nicaragua our attention was arrested by the brightness of the blue of the males and by the fact that some of them were marked by the collector as breeding. The nearest previous breeding record was Chiapas, Mexico. These facts prompted us to examine Blue Grosbeaks from other parts of their range and the large series of breeding birds in The American Museum of Natural History, including the Dwight collection, has enabled us to effect the present revision of races and ranges. At the same time, we have attempted to iron out certain nomenclatural difficulties.

The breeding range of the species as a whole includes, roughly, the southern half of the United States from the Atlantic to the Pacific and also extends through Mexico and Central America to Costa Rica, which latter country is approximately the limit reached in migration by the more northerly breeding birds. When one considers the varying climatic conditions prevailing over this extensive range one might expect greater geographical variations in the birds than are actually found, but birds increase gradually in size southward and grow somewhat paler under arid conditions. Oddly enough, however, the Costa Rican birds are the palest of any of the races into which the species may be divided. The species is arboreal and therefore does not occur in treeless areas.

Before proceeding farther, it seems desirable first to enter briefly into the nomenclatural history of the species and call attention to certain difficulties that arise. Linnæus (1758, 'Syst. Nat.,' 10th Ed., I, p. 75) was the first to describe the species under discussion and he named it *Loxia cærulea*, based on Catesby's Blue Grosbeak, *Coccothraustes cærulea*, of Carolina. This fixes the name *cærulea* for the eastern race. Next came Lesson, R. P. (1842, Rev. Zool., V, p. 174), who unmistakably described a Blue Grosbeak under the name *Pitylus lazulus*, giving the type-locality as "San-Carlos (Centre-Amérique)"; then came Coues (1874, Amer. Nat., VIII, p. 563), who separated the Mexican bird as *G. cærulea euryhyncha*; Nelson (1898, Proc. Biol. Soc. Washington, XII, p. 61, fig.),

who, on the strength of a single female, described the bird of Chiapas, Mexico, as a full species, *Guiraca chiapensis*; and Grinnell, J. (1911, Proc. Biol. Soc. Wash., XXIV, p. 163), who separated a Californian race under the name *Guiraca cærulea salicarius*.

The principal nomenclatural difficulty centers in Lesson's *lazulus*, for there has been doubt as to which San Carlos is his type locality. Ridgway assumed it was in Nicaragua (1898, Auk, XV, p. 322), the 'A. O. U. Check List' (1910, 3d Ed., p. 285) gave it as Salvador, and Salvador is probably correct. Dr. Charles W. Richmond in a letter has kindly given valuable information on this point. He says: "R. P. Lesson's brother (not son), Dr. Adolphe Lesson, was a French naval surgeon and I think his collecting must have been confined to seaports. His vessel traveled up the west coast of Central America and visited 'San Carlos,' Acapulco and other places." Dr. Richmond furthermore quotes from one of Findlay's directories of the Pacific Ocean, the following item: "Port La Union is an inner harbour or bay of the Gulf of Fonseca, and lies on the north side, around Chiriquin or Chicarene Point. . . . The town formerly known as San Carlos or Conchagua is situated on the south side of the port." Additional evidence that San Carlos is on salt water is found in a list of molluscs (1842, Rev. Zool., V, p. 185), about one of which we read "Cette Columbelle vit sur les côtes de l'Amérique baignées par l'océan Pacifique à Acapulco (Mexique) et à San-Carlos (Centre-Amérique)." La Union is also mentioned on p. 210, and all other collateral evidence supports Dr. Richmond's conclusions.

Geographical races were not recognized in Lesson's day, and unfortunately there is no means of knowing which of them was represented by his bird, but, judging by our material, the eastern *cærulea* is apparently the only one reaching so far south in the winter season. Under the circumstances we have deemed it expedient to restrict the name *lazula* to the resident form of Central America rather than rejecting the name altogether as unidentifiable. This course is in harmony with precedent, and seems to create the least nomenclatural disturbance, leaving only one race without a name and fixing the type locality of each within its breeding range.

Full descriptions of the plumages of the Blue Grosbeak may be consulted in standard works, so it seems necessary here only to touch upon the salient plumage characters that must be considered in determining the value of the races. All adult males are a rather glossy blue with dull black streaking on the back in the breeding season, when the rusty brown and whitish veiling of winter has been lost through the wearing

away of the faded feather tips; they are also distinguished by a large chestnut patch or band on the median coverts and a second band on the greater coverts. Young males and females are snuff brown with richer brown wing-bands, both sexes fading a good deal, but the males acquiring by a partial prenuptial moult in the early spring a variable amount of adult blue body feathers ranging from a mere scattering to a plumage virtually adult.

The geographical races of the Blue Grosbeak differ chiefly in size and in depth of color, the blue of the males being very stable throughout the year, the brown of the females subject to much fading. But there are other characters of some value, such as the color and width of the wing-bands and the extent of the edgings of the winter plumage. Heavy winter edgings result in slight veiling of the blue males when in breeding dress. Necessarily the characters of the races are most obvious in males.

A brief sketch of the geographical distribution of the chief differential characters seems appropriate at this point. From the Atlantic seaboard to about 100° W. longitude birds are uniformly small in size and deep in color. A score of breeding specimens from South Carolina prove to be inseparable from a like series taken in south central Texas (Menard and Kerr Counties) or central Kansas, but farther west and south birds average larger and paler, reaching a maximum in Arizona and northern Mexico where arid conditions prevail. Farther west in California the paleness persists but the size, especially of the bill, diminishes. Now, it is interesting to find the birds of southern Mexico as dark as eastern birds, although larger, the bills noticeably larger, just as Coues described them. Intermediate dark, large-billed birds breed in the mountains of Tamaulipas and Nuevo Leon, but in northwestern Mexico specimens approach the paler Arizona birds. The birds of the Rio Grande Valley are difficult to allocate because they are intermediate between three races, those of its lower portion being most like Eastern birds and those in the vicinity of El Paso more like the Arizona birds. We have not examined breeding specimens from Central America except those from the Pacific slope of Costa Rica and Nicaragua, where the lively, almost azure blue of the males can hardly be matched, approaching, however, the paler specimens of the Arizona race.

The following diagnoses are of the geographical races that seem to be worthy of recognition. Measurements of all females, except those of the typical race, *cærulea*, have been omitted because females are only proportionately smaller than males in all the races.

***Guiraca cærulea cærulea* (Linnæus)**

**SUBSPECIFIC CHARACTERS.**—Male, glossy navy to deep dull violaceous blue, veiled in winter with rusty browns and buffs becoming dull white on abdomen and tail-coverts; a large patch or band on the median coverts and a narrower band at tips of the greater coverts, both deep chestnut. Female, snuff brown, the wing-bands buff. Young male like the female but acquiring scattered blue feathers during the first winter. The blue in this race and in *eurhyncha* has a decided purplish tinge, and in both the wing-bands are alike, but *eurhyncha* is decidedly larger; *tazula* has similar wing-bands but is much larger and a bright blue that lacks the purplish tinge; *interfusa* is larger and less purplish in color than *cærulea* and has paler, broader wing-bands with one of them paler than the other; *salicaria* is like *interfusa*, except in size, having a very small bill.

**MEASUREMENTS.**—Males: wing, 84–92.5 (87.8); tail, 62–69 (66.0); tarsus, 19.9–21.8 (20.7); toe with claw, 19.6–22 (21.1); culmen, 14.8–18 (16.2); depth of bill, 11.3–12.1 (11.8). Females: wing, 80–85.4 (83.3); tail, 60.1–67 (63.5); tarsus, 19.7–21.8 (20.6); toe with claw, 21–22 (21.5); culmen, 15.1–16.8 (15.7); depth of bill at nostril, 10.5–12.5 (11.7).

**RANGE.**—Breeds in the southeastern United States west to central Kansas and western Texas, and north sparingly to New Jersey, Pennsylvania, West Virginia, Kentucky, Illinois and Nebraska; in winter reaches Cuba, eastern Mexico (Vera Cruz, Yucatan) and the Pacific slope of Guatemala (Pantaleon, San José).

**SPECIMENS EXAMINED.**—More than 150 from many localities throughout the breeding and winter ranges.

***Guiraca cærulea interfusa*, new subspecies**

**SUBSPECIFIC CHARACTERS.**—Similar to *cærulea* but larger and paler, the blue of the male less purplish (dark diva, or grayish violaceous blue), the anterior wing-band a paler chestnut, the other wing-band still paler and contrasting, both broader, and the winter veiling heavier. Like *salicaria* in color but larger, especially the bill. Lighter and smaller than *eurhyncha*. Females and young males larger and paler than *cærulea*.

**TYPE.**—No. 19356, Coll. J. Dwight; ♂ ad.; Fort Lowell, Arizona, May 31, 1905.

**MEASUREMENTS.**—Males: wing, 88–93 (90.3); tail, 66–71.5 (68.6); tarsus, 20.9–21.8 (21.2); toe with claw, 21–23.2 (21.8); culmen, 16.2–17.1 (16.7); depth of bill at nostril, 11.3–12.1 (11.7).

**RANGE.**—Arid portions of Arizona and northwestern Mexico and sparingly north to Colorado, Utah, Nevada and southeastern California; in winter, southwestern Mexico (Sinaloa, Tepic, Jalisco), and southern Lower California (Cape San Lucas).

**SPECIMENS EXAMINED.**—Breeding range, 28 ♂, 3 ♀; winter range in Mexico (Lower California, Sinaloa, Jalisco, Tepic, Durango, Colima and Valley of Mexico), 23 ♂, 2 ♀; a breeding ♂ from northern Chihuahua approaches *eurhyncha* in size of bill and depth of color; a winter ♂ from Morelos also approaches *eurhyncha* in size of the bill; also a young ♂ and a ♀ from Tamaulipas and a ♀ from Nuevo Leon.

This race is the arid representative of *cærulea* with which it intergrades in size and color to the east, similarly with *eurhyncha* to the south, also in size of bill with *salicaria* to the west.

***Guiraca caerulea salicaria* J. Grinnell**

SUBSPECIFIC CHARACTERS.—Bill, smallest of any of the races; in color resembles *interfusa*; paler, with wings and tail averaging slightly longer than *caerulea*.

MEASUREMENTS.—Males: wing, 83.6–92.3 (88.8); tail, 66–72.8 (69.6); tarsus, 20–22.1 (21.0), toe with claw, 20.2–23 (21.4); culmen, 14–16 (15.3); depth of bill at nostril, 10.7–11.6 (11.2).

RANGE.—Northern Lower California, southern California and the interior valleys north to Butte County; in winter, the Cape Region of Lower California.

SPECIMENS EXAMINED.—Breeding range, 11 ♂ 4 ♀, including Lower California (San Vicente 1 ♂, San Telmo 1 ♂; also San José del Cabo 1 ♂, 1 ♀ in winter.

***Guiraca caerulea eurhyncha* Coues**

SUBSPECIFIC CHARACTERS.—Like *caerulea*, deep in color, but larger, especially the bill; both wing-bands deep chestnut, like *caerulea* and *lazula*.

MEASUREMENTS.—Males: wing, 91–94.8 (94.4); tail, 68.5–73.5 (73.2); tarsus, 21.2–22 (21.6); toe with claw, 21.3–22.6 (22.0); culmen, 17.4–18.1 (17.8); depth of bill at nostril, 12.5–13.2 (12.9).

RANGE.—Southern Mexico, apparently resident.

SPECIMENS EXAMINED.—San Luis Potosí (Soledad 1 ♂); Guanajuato (Acambaro, 1 ♂); Vera Cruz (Huatusco, 1 ♂ ad., 1 young ♂); Distrito Federal (Tlalpam, 1 ♂); Guerrero (Chilpancingo, 1 ♂); Oaxaca, 1 ♂. Specimens from Nuevo Leon (Allende, Boquillo), Tamaulipas (Escandon, Xicotencatl) and Coahuila (Sabinas) approach *interfusa* in paler color and somewhat smaller bills, but some are like *caerulea* except for larger bills.

Coues rightly characterized this large billed race but he failed to indicate a more specific type locality than Mexico. It seems probable that the single female secured and named *chiapensis* is an unusually large billed *eurhyncha* for several of our specimens measure 18 mm. and the culmen of *chiapensis* is 20 mm. Occasional specimens of the other races have unusually large bills, and the same thing occurs in other species of Finches, rendering diagnosis of individuals difficult.

***Guiraca caerulea lazula* (Lesson)**

SUBSPECIFIC CHARACTERS.—Resembles *eurhyncha* in size and in deep chestnut wing-bands but the blue of the male strikingly paler and brighter (near cadet to diva blue) than in any other race.

MEASUREMENTS.—Males: wing, 88–94 (90.4); tail, 69.5–73 (72.4); tarsus, 20.5–21.3 (20.9); toe with claw, 21.3–22.3 (21.8); culmen, 17.1–18.2 (17.7); depth of bill at nostril, 12.6–13.3 (12.9).

RANGE.—Resident on the Pacific slope of Costa Rica, Nicaragua, and probably in the adjacent countries to the north.

SPECIMENS EXAMINED.—COSTA RICA: Las Cañas, Punta Piedra 4 ♂ ad., 3 young, 1 ♀, NICARAGUA: Matagalpa 3 ♂, Tipitapa 1 ♂, Sebaco 1 ♀, Leon 1 ♂.

The Leon bird is very dark, approaching *eurhyncha*, but the other specimens are typical except the females. The females of all the races are difficult to determine except by their size or when they are in fresh plumage.

