

## EYE-COLOR IN THE GREEN JAY

By GEORGE MIKSCH SUTTON

In two current and standard North American bird guides the color of the eye of the Green Jay (*Xanthoura yncas*) is shown as clear, light yellow. Whether or not we regard *Xanthoura yncas glaucescens* as a valid subspecies (see Hellmayr, Cat. Birds Amer., pt. 7, 1934:36, footnote), these pictures certainly are intended to represent the United States bird, that is, the race inhabiting the Lower Rio Grande Valley. I have observed the Green Jay repeatedly in the Brownsville region of Texas as well as at many localities in the Mexican states of Tamaulipas, Nuevo Leon, and San Luis Potosí, and I have yet to see anywhere throughout this region a yellow-eyed bird. I have handled or sketched in detail several freshly-killed male and female specimens, every one of which had dark brown eyes. I cannot say exactly how old these birds were, to be sure, but they were all in full winter or breeding plumage. I suspect that nestlings, as well as birds in juvenal feather, are *grayer*-eyed than full adults and birds in their first winter plumage, but of this I am not sure, for I have yet to observe the species in mid-summer. The fact that on numerous occasions I have made a point of inspecting good-sized companies of jays (in which there almost certainly were fully adult as well as first-year birds), without ever discovering among them a yellow-eyed individual, I regard as significant.

The concept of a yellow-eyed Green Jay may well be traceable to Louis A. Fuertes' portrait of the bird in Bird-Lore (1919: plate opp. p. 149), an animated study which probably was based on the artist's personal experience in Colombia, Yucatan, or possibly Veracruz. Interested in determining why Fuertes had so painted the species, as well as in making certain that ornithologists were not overlooking some striking difference in eye-color between South American and North American birds, I asked Robert Cushman Murphy to look through the Fuertes original drawings now in the possession of the American Museum of Natural History in the hope of finding at least one field-sketch of the Green Jay. Dr. Murphy courteously wrote me under date of February 26, 1947, that he had gone over the "entire series of the Fuertes paintings and other sketches," but found "nothing whatsoever" representing the genus *Xanthoura*.

Pursuing further the matter of the Bird-Lore color-plate, I borrowed from Cornell University all *Xanthoura* specimens bearing original Fuertes labels and requested my friend Dwain W. Warner to search the Fuertes field catalogues for notes pertaining to Green Jay eye-color. No evidence came to light.

J. Kenneth Parkes generously transcribed from labels of Green Jays in the American Museum of Natural History all comments pertaining to eye-color. His carefully prepared report gave me, at long last, definite proof that at least some South American Green Jays were yellow-eyed, but it just as clearly proved that some North American Green Jays also were yellow-eyed. Labels on 7 South American Green Jays clearly indicated that the living birds had been yellow-eyed, and he found no specimen so marked as to indicate that it had been brown-eyed. A male and female taken at Zamora, Province of Loja, Ecuador, by W. B. Richardson had had "yellow" eyes. A male collected by W. Hoffmans at Libertad, Province of Huanuco, Peru, and a male collected by O. T. Baron at Livanto, Peru, had had "gold" and "yellow" eyes, respectively. These four specimens represented the nominate, as well as the most southward ranging, race (see Hellmayr, *op. cit.*:31).

Among several Colombian specimens at hand are 5 well prepared Fuertes skins—2 *X. y. galeata* (from Miraflores and Fusugasugá, respectively) and 3 *X. y. cyanodorsalis* (2 from Monteredondo and 1 from Quetame)—all with good labels in Fuertes' own handwriting. Unfortunately, however, not one of the labels bears so much as a word as

to the colors of the fleshy parts. Chapman (Distribution of Bird-Life in Colombia, Bull. Amer. Mus. Nat. Hist., 36, 1917:637-639), who does not list *Fusugasugá* among the localities at which *galeata* was taken, nor Monteredondo among the localities at which *cyanodorsalis* was taken (despite the facts that Fuertes was a member of both the 1911 and 1913 expeditions, and that the Fuertes specimens were available to Chapman when he was working up his material), makes no comment whatever on colors of fleshy parts of living birds. Mr. Parkes found in the American Museum collection two Colombian specimens which had label-comments on eye-color. One of these, a male from Los Tambos, collected by J. H. Batty, had had "pale yellow" eyes. The other, an unsexed specimen from the Cauca Valley, collected by P. W. Pain, had had "yellow" eyes.

As for Venezuelan birds (*X. y. cyanodorsalis* and *X. y. caeruleocephala*), I hesitate at this writing to say that all are yellow-eyed, although my friend W. H. Phelps believes that they are. A female in the American Museum of Natural History collected by F. W. Urich at Quebrada Seca (near Mérida; see Phelps, Bol. Soc. Venez. Ciencias Naturales, no. 61, 1944:419 and map opp. p. 418), had had "yellow" eyes. In the Phelps Collection in Caracas there are 80 Venezuelan specimens of *Xanthoura yncas*—27 of *cyanodorsalis* and 53 of *caeruleocephala*. Mr. Phelps has been good enough to examine the labels of all of these critically for me, reporting that 74 clearly gave the eye-color as yellow, but that 3 (*cyanodorsalis*) indicated "sepia" eyes, 1 (*caeruleocephala*) indicated "brown" eyes, and 2 (*caeruleocephala*) indicated "dark" eyes. He commented that the series was "the work of many different collectors, so the color 'sepia,' 'brown,' and 'dark' may well have been the interpretation of different collectors for the same color." I cannot quite agree with this comment. Granting that what is "sepia" to one person might conceivably be a shade of yellow to another, I nevertheless feel that a better explanation is that young Green Jays of all races probably are somewhat darker eyed than adults and that this dark eye-color might easily have been called "sepia" by one collector, "brown" by another, and "dark" by a third.

Summarizing the foregoing, we may state that all South American Green Jays probably are yellow-eyed when adult. In view of the fact that the North American Green Jays are, as a group, widely separated from those of South America (there being no Green Jay in Panama, Costa Rica, or Nicaragua), we might reasonably expect the South American birds to constitute a full species characterized at least by yellow-eyedness, if in no other way. Such obviously is not the case, however, for several specimens from Yucatan and British Honduras, as well as one Sumichrast specimen in the American Museum of Natural History, believed to have been taken in the vicinity of Tehuantepec, Oaxaca, were yellow-eyed; and the fact that two male specimens collected by J. H. Batty in Jalisco were, respectively, "hazel" and "dark hazel" in eye-color, suggests that there probably is a zone of intergradation, rather than a definite break, between the yellow-eyed and brown-eyed birds. The term "hazel" is, admittedly, somewhat doubtful, but I believe we are safe in assuming that Batty's "hazel," and even his "dark hazel," were shades of brown definitely lighter than that of the eyes of birds from Texas, Nuevo Leon, San Luis Potosí, and Tamaulipas which I have handled.

I have not, thus far, come upon any specimens from Honduras or eastern Guatemala whose labels bore comments as to eye-color. In the University of Michigan Museum of Zoology there are, however, two beautiful male specimens of *X. y. centralis* collected by Van Tyne at Cayo, British Honduras, both of which had had, according to statements on the labels, "Light Cadmium" irides.

As for *X. y. maya*, the race inhabiting Yucatan, there are no comments concerning eye-color on the labels of two Fuertes specimens collected in 1910 at Chichen-Itza. But in the Museum of Zoology at the University of Michigan I find two specimens, a

male and a female taken by Van Tyne at Chichen-Itza, which had had, respectively, "Light Cadmium" and "yellow" eyes.

*X. y. vivida*, the race inhabiting western Guatemala (departments of Sololá and Huehuetenango), the Mexican states of Chiapas and Oaxaca, and possibly also Michoacan, Guerrero and Colima (see Hellmayr, *op. cit.*:35), presumably is yellow-eyed. I already have commented on the Sumichrast specimen from Tehuantepec. In my own collection there are 3 specimens of *vivida* taken by Helmuth Wagner at Prussia, Chiapas, all of which had "yellow" eyes.

*X. y. luxuosa* may or may not be yellow-eyed. Unfortunately the original labels of two specimens at Cornell University which Fuertes collected at Córdoba, Veracruz, in 1910, and which may well have been partly responsible for his belief that all Green Jays were yellow-eyed, bear no comments as to eye-color. Wetmore (Proc. U. S. Nat. Mus., 93, 1943) did not himself collect any Green Jays in the Sierra de Tuxtla; but in writing me of his failure to discover anything pertaining to *Xanthoura* eye-color in the field notes of M. A. Carriker, he expressed an "indefinite memory" that "the sexes in *Xanthoura* may differ somewhat in eye-color," and I wonder if this "memory" may not be of southern Veracruz birds which happened to be intermediate in eye-color, or of pairs in which one bird was brown-eyed and the other yellow-eyed, exactly as one might expect to find them in an area of intergradation.

From all that I have so far presented it would appear that only the very northernmost of the Green Jays have really dark brown eyes. In plate 42 of volume 2 (Land Birds) of Baird, Brewer and Ridgway's "A History of North American Birds" (Little, Brown and Company, Boston, 1905) the head of a Green Jay is shown in color. The eyes of this figure are dark brown. The legend reads: "New Leon, New Mex" [*sic*]. An adult female which I collected at La Paloma, Cameron County, Texas, on March 10, 1938, had "dark brown eyes." Specimens which John B. Semple, Thomas D. Burleigh and I took near Monterrey, Nuevo Leon, in 1938, were all brown-eyed. One of these, a male taken by Burleigh, I sketched in detail on February 6. Adults which O. S. Pettigill, Robert B. Lea, Dwain W. Warner and I took along the Rio Sabinas, in the Gomez Farias region of southwestern Tamaulipas, in the spring of 1941, all were brown-eyed. The southernmost point at which I have seen the Green Jay is Jalapa, Veracruz. I did not, unfortunately, collect a specimen there and am not certain as to the eye-color of birds which I saw at a distance. Where the zone of intergradation between yellow-eyed and brown-eyed birds lies is, then, a moot matter.

Somewhere in Tabasco or Campeche, possibly, as well as in certain south-central Mexican States, we may logically expect to find populations of Green Jays in which the eyes are neither dark brown nor yellow. Such populations ought to assist us in plotting the ranges of the races involved. It is my present belief that the races *luxuosa* and *glaucescens* are brown-eyed and that they are the only races of those now recognized which are so colored.

In any event we may, with assurance based in part on my own field experience, make the following statements: 1. The Green Jay of the United States has dark brown eyes when adult. Pictures of *Xanthoura yncas* which are to represent the species as bird students will see it at Brownsville, Texas, should, therefore, show the eyes as brown. 2. Whatever the final explanation of the Panamanian-Central American gap in the range of the monotypic genus *Xanthoura*, yellow-eyedness is characteristic of birds found both to the north and to the south of the gap, hence it is reasonable to believe that the ancestral form was yellow-eyed and that the brown-eyed race or races are those which have most recently evolved.

*Museum of Zoology, University of Michigan, Ann Arbor, Michigan, April 30, 1947.*