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# GEOGRAPHIC VARIATION IN AZARA'S MARSH BLACKBIRD, AGELAIUS CYANOPUS

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Of the well-known and widely distributed icterid genus Agelaius, perhaps the least studied species has been Azara's Marsh Blackbird, A. cyanopus Vieillot, of Argentina, Paraguay, Bolivia and Brazil. It has been universally treated as a monotypic species. This is understandable in view of its general rarity in collections; those few institutions fortunate enough to possess specimens of Agelaius cyanopus from more than one population seldom, if ever, have series comparable as to age and sex. To complicate matters further, there is no detectable geographic variation in definitively plumaged males other than in size; all are simply black. The realization that three specimens in Carnegie Museum, long generically misidentified, actually represented an isolated and strikingly different population of Agelaius cyanopus led to a study of this species based on material assembled from several museums. It quickly became apparent that A. cyanopus, like most of its congeners, is most emphatically a polytypic species, with no less than four morphologically distinct and geographically isolated populations. Of the three outlying populations, a total of only 22 specimens could be assembled; over twice this number of the nominate race were examined.

All measurements in this paper are in mm. The wing was measured flattened against the ruler. The tail measurement is the standard one for birds, and the bill measurement is that of the total length of the culmen from the base.

Acknowledgments: In addition to specimens in the Carnegie Museum, material from the following museums was examined (abbreviations used later in the paper are noted): Academy of Natural Sciences of Philadelphia (ANSP), American Mu-

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seum of Natural History (AMNH), Museu Goeldi, Belém, Brazil (MG), Museu Nacional, Rio de Janeiro, Brazil, and Peabody Museum of Natural History, Yale University. I am indebted to the authorities of these institutions for permission to borrow their specimens. In addition, valuable information was contributed toward this study by Mr. Hugh Cott of Cambridge University, Mr. Derek Goodwin of the British Museum (Natural History) (BM), Dr. F. C. Novaes of the Museu Goeldi, and Dr. Helmut Sick of the Museu Nacional.

#### PLUMAGE SEQUENCE

Definitively plumaged males of Agelaius cyanopus differ from all other members of the genus in being wholly black (slightly glossed with blue), with no red, brown or yellow on the head, wing, or elsewhere. In color they thus resemble females of the distinctive races of the Red-winged Blackbird, A. phoeniceus (Linnaeus), inhabiting Cuba (assimilis) and the Isle of Pines (subniger). The Jamaican Nesopsar nigerrimus (Osburn), which is essentially a short-legged, short-tailed arboreal Agelaius, is also entirely black, but is more iridescent than is A. cyanopus, and lacks the distinct sexual dimorphism of the latter species. I have seen no specimens which would indicate that adult males of A. cyanopus in freshly molted plumage have the brown featheredgings characteristic of several of the species of Agelaius at this stage.

Definitively plumaged females, as well as both sexes in juvenal and first basic plumages, are completely unlike the adult males. Birds in these plumages (with the exception of one population, to be discussed beyond) are more or less heavily streaked with black and some shade of brown dorsally, have rufous or brown edgings on remiges and wing coverts, and are yellowish or greenish ventrally, the exact color varying with sex, age, and population. The underparts may also be more or less streaked with blackish.

The following descriptions of plumage sequence are based primarily on specimens of the nominate race, of which the largest series was available. In both sexes, the juvenal plumage is dull buffy yellow below, finely streaked with black on breast, upper abdomen and flanks, sometimes on throat and lower abdomen also. The number of specimens available is insufficient to be certain as to whether there is sexual dimorphism in the juvenal plumage; it is possible that males may be somewhat darker on the crown, and have the ventral streaking extending farther caudad.

Two specimens (AMNH 32835 and 149815) are believed to represent, respectively, the fresh and worn first basic plumage of the female. This, as would be expected, differs from the juvenal plumage in lacking the rather plumulaceous or "fluffy" texture typical of juvenile passerines. In addition, the flanks are more heavily streaked than in the juvenal plumage, while the streaking of the remainder of the underparts is replaced by finer shaft-streaks which become accentuated with wear. The ground color of the underparts is more yellow, less buffy.

By the time the first basic plumage of the male (exemplified by AMNH 32836 and 521164) has been assumed, the larger size of that sex has become apparent. Young males missexed as females may be found in almost every series of this species, but may be identified by their larger size and, later, by incoming black feathers. In the first basic plumage of males, the ground color of the crown and nape is yellower, less chestnut than in females, thus contrasting more with the black central streaks. The underparts resemble those of the female, but are less streaked, sometimes virtually immaculate centrally. Few molting specimens are available, but those examined suggest that the first prebasic ("postjuvenal") molt may include both remiges and rectrices.

There is some evidence of a partial prealternate molt in young males, during which a varying number of black feathers appear on the face and throat and scattered on the underparts; these may be duller than the definitive black feathers (AMNH 128351, 521167). AMNH 32834 and 32838 are undergoing the molt into the definitive basic plumage, with certain black feathers apparently being of an older generation, *i.e.*, of the first alternate plumage. The series from any one locality is insufficient to determine the plumage cycle of adult males, but by analogy with the young and with related species, they probably have at least a limited prealternate molt.

Definitively plumaged females are less streaked below than are those in the first basic plumage, the streaking when present usually being confined to the flanks. The dorsal color is colder and less rufescent, contrasting less with the central streaks, which are broader. The material examined was inadequate to demonstrate anything more than the probability of a first (and presumably later) prealternate molt in females.

#### SUBSPECIES

#### Agelaius cyanopus cyanopus Vieillot.

Agelaius cyanopus Vieillot, Nouv. Dict. Hist. Nat., nouv. éd., 34, 1819: 552 (Paraguay, ex Azara).

C[assicus] T. hybridus Merrem, in Ersch and Gruber, Allg. Encycl. Wiss., 15, 1826: 279 (Paraguay, ex Azara).

Leïstes unicolor Swainson, Anim. Menag., 1837: 304 ("Brazil"; see below).

This is the best-known subspecies, and the commonest in collections. It occupies a range far larger than that of any of the other three subspecies here recognized. The synonymy of this race calls for certain comments. Merrem's name *hybridus* is an absolute synonym of *cyanopus* Vieillot, having been based, as was the latter, on Azara's "Tordo negro

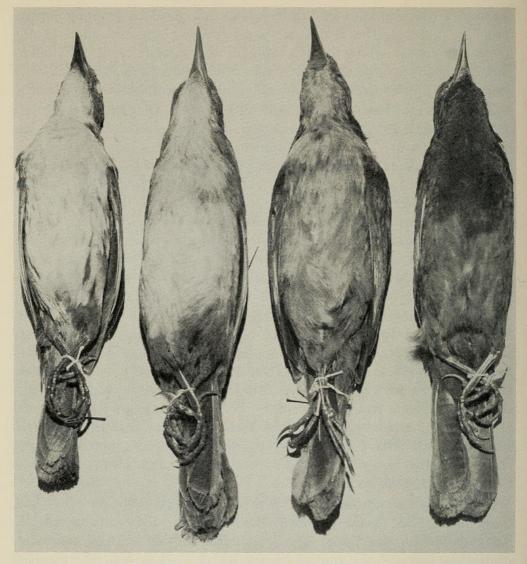


FIG. 1. Females of Agelaius cyanopus: left to right, A. c. cyanopus, Carnegie Mus. 31442, Puerto Suarez, Bolivia; A. c. beniensis, new subspecies, ANSP 119426, Chatarona, Bolivia; A. c. atroolivaceus, Mus. Nac. Rio de Janeiro 20529, Sarapuí, Brazil; A. c. xenicus, new subspecies (Type), Carnegie Mus. 68658, Arucauá, Brazil.

y vario." The next name listed by Hellmayr (1937: 180) in the synonymy of *cyanopus* is "(?) *Icterus atro-violaceus* Wied," 1831. This is a *lapsus* on Hellmayr's part for *Icterus atro-olivaceus* (neither version, incidentally, appearing in Hellmayr's index), a name revived for another subspecies in the present paper, beyond. Then comes *Leïstes unicolor* Swainson, 1837, which bears no locality other than "Brazil." Three of the four subspecies are found within the borders of Brazil, so identification of Swainson's types was imperative. The specimens are still extant, in the Cambridge University Museum of Zoology, where Mr. Hugh B. Cott was kind enough to examine them for me. His description of Swainson's female cotype indicates that *unicolor* is a synonym of *cyanopus*, and I therefore hereby restrict the type locality of *unicolor* to the Rio Paraná, Brazil, a source of other early specimens of this species (Sclater, 1886: 345). Gyldenstolpe (1945: 265) apparently misread the footnote by Hellmayr (1937: 180, footnote 2), as he cites, in his synonymy of *Agelaius cyanopus*, "*Leistes unicolor* Swains. Anim. in Menag. p. 304, 1837 (ex D'Orbigny)—'Brazil' (errore) = E. Bolivia." The reference to d'Orbigny and the correction of the type locality to eastern Bolivia apply not to Swainson's *unicolor* but to another name, *Agelaius xanthocarpus* (not "*xanthoscarpus*" as spelled by Hellmayr, 1937: 180) Bonaparte (1850: 430), alleged to have come from "Peru," not Brazil. Gyldenstolpe's citation is clearly a *lapsus* and does not affect the restriction of the type locality of *unicolor* Swainson, above.

Hellmayr examined the cotypes in the Paris Museum of Bonaparte's Agelaius xanthocarpus (Hellmayr, 1937: 173; 180, footnote 2). He found them to be examples of the Chilean race of Agelaius thilius, whereas the description of the female was based on a d'Orbigny specimen of A. cyanopus from Chiquitos, eastern Bolivia. Birds from the latter area are referable to nominate cyanopus, so no nomenclatorial complications ensue. The name xanthocarpus Bonaparte clearly belongs in the synonymy of thilius, but in view of the composite nature of Bonaparte's original description it may well be desirable to stabilize the name xanthocarpus by considering as its lectotype the immature male specimen of thilius upon which Bonaparte (according to Hellmayr) based his description of the male.

*Measurements*: 13 adult males, wing 91–97 (93.7); tail 77.5–86 (82.4); culmen 23.5–25.5 (24.5). 13 adult females, wing 83–90.5 (86.0); tail 70–80.5 (75.6); culmen 21.5–23.5 (22.5).

Eastern Bolivia (Dept. Santa Cruz), southern Brazil (Matto Range: Grosso, Goiás, São Paulo, Paraná), Paraguay, and eastern Argentina from Formosa and Misiones south to Buenos Aires. In Brazil, this form does not appear to have been recorded east of the Rio Paraná except in northwesternmost São Paulo (localities given by Pinto, 1944: 576-577). Although it occurs east of the Paraná in Argentina, it has not been recorded from Uruguay (Cuello and Gerzenstein, 1962). Hellmayr (1937: 180, footnote 3) was skeptical about the validity of a record of Agelaius cyanopus from Barracas al Sud, Prov. Buenos Aires, Argentina (Hartert and Venturi, 1909: 185), as he did not believe this species occurred as far south as Buenos Aires. He pointed out that the record was "based on a single young bird," originally listed as "& juv." I have examined this specimen, which came to the American Museum of Natural History with the Rothschild collection (now AMNH 521164). It is a perfectly typical example of A. c. cyanopus, a male in fresh first basic plumage. This bird might be considered a stray were it not for the fact that an additional AMNH specimen of cyanopus from Buenos Aires Province is an almost certainly locally-raised juvenile. It is the specimen listed by Hartert and Venturi (loc. cit.) as "& juv." of "Agelaius thilius

chrysocarpus" from Flores. This specimen is unequivocally A. cyanopus and not A. thilius; the two species are easily separable in juvenal plumage. Two additional specimens from Buenos Aires Province are listed by Pereyra (1938: 251), who also discusses the distribution and habits of the species in this part of Argentina.

#### Agelaius cyanopus atroolivaceus (Wied).

Icterus atro-olivaceus Wied, Bietr. Naturg. Bras., 3 (2), 1831: 1216 ("an der Ostküste von Brasilien, in der Gegend von Coral de Batuba, bei der Lagoa Feia, zwischen den 22sten und 23sten Grad südlicher Breite" [= Curral de Batuba, near Lagôa Feia, Est. Rio de Janeiro, Brazil; see Pinto, 1944: 576, footnote]).

The International Code of Zoological Nomenclature, articles 27 and 32c (i), requires the deletion of the hyphen in Wied's original spelling "*atro-olivaceus.*" As noted above, Hellmayr (1937: 180) inadvertently listed this name as "*atro-violaceus*"; this misspelling was repeated by Pinto (1944: 576, footnote) and by Schneider and Sick (1962: 12).

Hellmayr did not examine Wied's type, but commented (1937: 180, footnote 1) that the description "agrees none too well with the characters of the present species [cyanopus]," and that "the locality, coast of Rio de Janeiro, furthermore, is far away from its established range." He suggested (p. 181, footnote) that there might be some relation between atroolivaceus and the mysterious Agelaius forbesi Sclater, known from a single specimen from Pernambuco.

The Wied type, an adult female, is now no. 4731 in the AMNH collection, where I have examined it. My first impression was that this specimen, in remarkably good condition despite its age of over 130 years, was a discolored specimen of nominate *cyanopus*, perhaps a vagrant to Rio de Janeiro. Helmut Sick, however, called my attention in correspondence to the paper by Schneider and Sick (1962), listing additional specimens of this species from the state of Rio de Janeiro, and was kind enough to send me these specimens. Comparison of this series with Wied's type makes it clear that all of these birds belong to an isolated population of *Agelaius cyanopus*, whose distinctive characters account for the discrepancies noted by Hellmayr.

Black-plumaged males of *atroolivaceus* differ from those of nominate *cyanopus* only by having a somewhat greater average culmen length (see measurements). Females and young males differ, plumage for plumage, from *cyanopus* in being very much darker both above and below. The underparts of adult females are deep olive green instead of the rather bright greenish yellow of *cyanopus*, and there is more difference between the underparts color of adult females and both males and females in first basic plumage than is true of *cyanopus*. Dorsally *atroolivaceus* is much more heavily pigmented, with greatly reduced contrast between edgings and centers of feathers of the crown, nape, mantle, wing coverts and remiges. The brightest specimen of *atroolivaceus* is the one from

Petrópolis listed as a female by Schneider and Sick. It was sexed on the label as a male by the collector, J. Hidasi, and its measurements (wing 92, tail 81+ [worn], culmen 25) as well as a few black feathers on the throat indicate that the collector's sexing was accurate. This specimen, of all of the *atroolivaceus* seen, most nearly approaches *cyanopus* in color, but has darker, duller and narrower edgings on the feathers of the upperparts and wings.

*Measurements*: males, wing 92, 94.5, 95, 95; tail 81, 83, 84, 86; culmen 25, 25.5, 26. Females, wing 84.5, 85, 87.5, 88; tail 74, 75.5, 79, 80; culmen 22, 23, 23.5, 24.

*Range*: Known only from the state of Rio de Janeiro, Brazil, from the following localities: Lagôa Feia (Curral de Batuba and Ponta Grossa; see Pinto, 1944: 576), Petrópolis, Sarapuí, and a sight record from Lagôa Jacarepaguá, the latter within the limits of the city of Rio de Janeiro (Schneider and Sick, 1962: 12).

#### Agelaius cyanopus beniensis, new subspecies

*Holotype*: Acad. Nat. Sci. Philadelphia no. 119424, adult female, Chatarona (600 feet), Dept. El Beni, Bolivia, collected 20 September 1934 by M. A. Carriker, Jr. (original no. 10110).

*Characters*: Wing and tail decidedly and culmen slightly longer than those of any other population, with size difference best expressed in males. Females, plumage for plumage, are slightly deeper and less yellowish in color on the underparts than *cyanopus* (although not as dark as *atroolivaceus*), with flanks and under tail coverts duskier. Definitively plumaged females are blackish above, equalling or exceeding *atroolivaceus* in saturation, but females in first basic plumage are not much darker dorsally than *cyanopus*. Females of both age classes of *beniensis* have blackish or dark olive under wing coverts, as do females and young males of *atroolivaceus*, whereas in *cyanopus* these feathers are yellow. No young males of *beniensis* have been seen, but they presumably match females in dark coloration.

*Measurements*: males, wing 98, 101, 102; tail 86.5, 88, 93.5; culmen 24, 24, 26. Females, wing 88.5, 90.5, 92, 92, 93; tail 77, 78, 82, 83.5, 85; culmen 22, 23, 23, 24, 25. For additional measurements, see *Remarks*, below.

*Range*: Known only from a small area of the western portion of Dept. El Beni, Bolivia, near the Río Beni (Chatarona, Reyes, El Consuelo). For a description of the type locality, see Bond and de Schauensee, 1942: 311.

*Remarks*: I have not examined the series from El Consuelo reported by Gyldenstolpe (1945: 265), but the wing measurements given are clearly those of *beniensis*. Gyldenstolpe did not state the number of specimens actually measured, but his total series consisted of 9 adult  $\delta \delta$ , 4 "juv."  $\delta \delta$ , and 8  $\varphi \varphi$  (age not specified). His measurements are as follows: males, wing 100–104; tail, 82–88. Females, wing 86–93; tail

70–78. Gyldenstolpe's tail measurements seem small; perhaps some of these birds were molting. His bill measurements are not given here, as he measured "exposed" rather than total culmen, so our figures are not comparable.

In addition to the series reported respectively by Gyldenstolpe and by Bond and de Schauensee, there is a hitherto unpublished record of *Agelaius cyanopus* from this portion of Bolivia. An adult female of *beniensis* was collected by Luis E. Peña at Reyes on 9 December 1956; the specimen is now no. 38861 in the collection of the Peabody Museum of Natural History, Yale University.

The range of this subspecies may well be larger than here described, as much of northern Bolivia has been inadequately explored ornithologically. The Río Beni is a tributary of the Amazon, whereas the area occupied by nominate *cyanopus* lies wholly (or almost wholly) within the drainage of the Rio Paraná. If the range of *beniensis* is, as postulated above, larger than now known, the two forms may possibly meet somewhere in the vicinity of the drainage divide in northeastern Bolivia.

#### Agelaius cyanopus xenicus, new subspecies

Holotype: Carnegie Museum no. 68568, adult female, Arucauá, Terr. Amapá, Pará, Brazil, collected 12 June 1918 by S. M. Klages (original no. 16919).

*Characters*: Definitively plumaged males wholly black, as in other races, but females and male in first basic plumage completely unlike any other population of *Agelaius cyanopus*, as follows: entire head, mantle and breast black, the mantle feathers narrowly edged with dark olivebrown (females) or very dark chestnut (young male); rump and upper tail coverts black washed with dark olive; inner secondaries, tertials and greater coverts narrowly edged with dark brown (disappearing with wear); flanks and under tail coverts blackish olive; abdomen dark olive, somewhat yellower posteriorly (especially in first basic plumage), and mixed anteriorly with traces of chestnut (more conspicuous on the young male); dark olive feathers of anterior portion of abdomen with somewhat lighter centers, giving the effect of vague streaking.

In addition to the type, there is a second female specimen in the Carnegie Museum collection, taken at the same locality a week later. I would judge this to be a year-old bird, just prior to the commencement of its second prebasic molt (it, like the type, is quite worn). There is no way of knowing whether it had undergone a prealternate molt. The base of its lower mandible is brown, not black, ordinarily a character of young individuals of this species. It differs from the type as follows: olive-brown edgings of mantle paler, more distinct (and probably broader when unworn); rump not as dark olive; posterior abdomen brighter, more yellowish olive; black feathers of lower breast as well as adjacent olive feathers of upper abdomen with narrow pale central streaks.

The small series available suggests that *xenicus* may average somewhat

longer-winged than either *cyanopus* or *atroolivaceus*; the bills of this subspecies, while averaging only slightly shorter than those of other races, are noticeably stockier and less attenuated in profile.

*Measurements*: males, wing 94.5+ (worn), 96+, 99; tail 80.5+, 82+, 85+; culmen 23, 23.5, 23.5. Females, wing 87+, 89+; tail 74.5+, 77+; culmen 22, 23.

*Range*: Known from three rather widely separated localities in northeastern Brazil: the type locality, in the drainage of the Rio Oyapock (Oiapoque) near the French Guiana border; Arumanduba, on the north bank of the lower Amazon in Pará; and São Bento, on the small Rio Aurá west of the Baia de São Marcos in northwestern Maranhão. The species has not been authentically reported from French Guiana; a "Cayenne" specimen in the Rivoli collection, now ANSP no. 3607, is an adult male which appears to be too slender-billed for *xenicus*; its wing measurement is slightly shorter (94 mm, unworn) and its culmen slightly longer (24 mm) than those of any of the three male *xenicus* measured. The type locality of *xenicus* is so close to the border of French Guiana, however, that Agelaius cyanopus may be expected to occur in the latter country.

*Remarks*: The type locality was written "Rocaua, Uassá Swamp, N. Pará" on the labels of the collector, S. M. Klages. This was a phonetic rendition, the current spellings being "Arucauá" and "Uaçá," respectively. Todd (1942: 369) has already explained that he had misread Klages' handwriting and given this locality as "Rocana" in earlier papers based on this collection. According to Klages' field notes, the Rio Arucauá runs through the center of what is, in the rainy season (December to July), a vast swamp formed by the flooding of virtually the entire Uaçá basin, forming what Klages called "the Great Uassá Swamp." Several igneous outcroppings form islands during this wet period. Klages' camp, from which collecting excursions were made into the swamp by canoe, was on a small unnamed island close to the locality marked as "Arucauá" (which at the time of Klages' visit was apparently an Indian village of a few huts) on sheet N.A. 22 of the "Millionth Map" (Brazilian Provisional Edition of 1922 examined).

The only collector other than Klages known to have obtained specimens from this outlying northeastern population of Agelaius cyanopus was Emilia Snethlage. She listed one adult male, four young males and one female from Arumanduba (Snethlage, 1914: 421). I have been able to locate only two of these specimens. One was loaned to me through the kindness of Dr. F. C. Novaes, Curator of Birds at the Museu Goeldi, Belém (formerly Pará), Brazil. Dr. Novaes informs me that this specimen is the only one of the original six still in the Museu Goeldi, and it is in very poor condition. It appears to have been both water-soaked and badly attacked by insects at some time in the past, and it is possible that some of the other specimens in this series were completely destroyed at that time. The specimen examined is MG no. 10378 (original Snethlage no. 255), collected at Arumanduba 30 December 1912. It is sexed "ð" and appears to have been in juvenal plumage. Feathers are completely

absent from the entire throat, breast and abdomen, being present on the underparts only on the flanks and under tail coverts. The upperparts are badly chewed, as are the wings and tail, but are obviously much darker than the equivalent plumage of A. c. cyanopus. The greater wing coverts and tertials are edged with chestnut, again very much darker than in cyanopus. The head and back appear to have been black, washed slightly with greenish at the sides of the neck; a vague, dull yellowish moustachial streak remains on one side. The flank feathers are paler than those of a male in first basic plumage (to be mentioned below), but darker than those of juvenile *cyanopus*. This specimen suggests that the juvenal plumage of A. c. xenicus may resemble in pattern those of the other races rather than having the entire head, neck and breast black as in later plumages. Snethlage's description of the female of "Agelaeus [sic] cyanopus," "parte inferior amarella olivacea indistinctamente raiada de enegrocido," suggests that her single female from Arumanduba was a juvenile.

The second Arumanduba specimen known to be extant is that upon which the description of the first basic plumage of the male, above, is based. It was exchanged to the American Museum of Natural History (where it is now AMNH 128981) at some time prior to the disaster which befell the juvenile male, and is happily in excellent condition. It is upon this specimen that the identification of the Arumanduba population with *xenicus* rests, and it clearly belongs to the same subspecies as the two females from the type locality.

The third locality in northern Brazil from which Agelaius cyanopus has been recorded is São Bento, Maranhão (Snethlage, 1926: 61). Only one specimen was collected. It is now no. 15792 in the collection of the Museu Nacional in Rio de Janeiro, and was loaned to me through the courtesy of Dr. Helmut Sick. Unfortunately, it is an adult male and thus useless for color comparisons, but its long wing (99 mm) and its stubby, non-attenuated bill indicate that it belongs with *xenicus* as would be expected on geographic grounds.

Sclater (1886: 345) listed a specimen in the British Museum as an adult female from "Para (?)." Mr. Derek Goodwin was kind enough to send me a description of this specimen (BM no. 1845.8.25), which is clearly *not* an adult female of *xenicus*. Mr. Goodwin states that there is no indication of sex on the label, and that he suspects "it is a male juvenile as another one rather like it but not quite so dark (BM no. 1885.11.2.291, no locality) is moulting into black plumage." Mr. Goodwin's description of the upper parts as "very dark reddish brown with prominent dark striations" is not compatible with the one apparently juvenile male of *xenicus* known, the damaged specimen from Arumanduba. In all, the description suggests that the specimen from "Para (?)" may be an example of *atroolivaceus*, but in any case the locality can safely be said to be erroneous, justifying the original query.

The name chosen for this subspecies, from the Greek *xenikos*, strange or foreign, is intended to reflect both the decidedly different appearance

and the remoteness of the range in relation to the other populations of *Agelaius cyanopus*.

#### SUMMARY

Azara's Marsh Blackbird, *Agelaius cyanopus*, is not a monotypic species as previously considered. There are four subspecies, one of wide distribution, the other three isolated and local. These are, respectively, nominate *cyanopus* from the Río Paraná drainage in eastern Bolivia, Paraguay, southern Brazil, and northeastern Argentina; *atroolivaceus*, a dark, slightly longer-billed race from the coast of Rio de Janeiro, Brazil; *beniensis*, new subspecies, a large dark race from the vicinity of the Río Beni, northern Bolivia; and *xenicus*, new subspecies, a melanic, stout-billed race from northeasternmost Brazil. The plumage sequence is outlined as well as can be determined from limited material. Geographic variation in color is confined to young of both sexes and adult females, as all adult males are wholly black.

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