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Review of Red-winged Blackbirds (*Agelaius phoeniceus*) of Eastern, West-central, and Southern Mexico and Central America

BY ROBERT W. DICKERMAN¹

ABSTRACT

The Red-winged Blackbird [*Agelaius phoeniceus* (Linnaeus)] populations of Mexico and Central America (except those of northwest Mexico) in which the females have striped breasts are reviewed. Three subspecies are recognized from the Pacific and southern interior regions: *A. p. nayaritensis* Dickey and Van Rossem, *A. p. nelsoni* Dickerman, and *A. p. grinnelli* Howell (including *costaricensis* Van Rossem). Four subspecies are recognized from the Gulf and Caribbean lowlands: *A. p. megapotamus* Oberholser, *A. p. richmondi* Nelson (including *matudae* Brodkorb and *brevirostris* Monroe), and *A. p. pallidulus* Van Tyne and Trautman, with *A. p. arthuralleni*, from interior Lago Peten Itza, Guatemala, described as new. A map showing ranges and collecting localities is included.

INTRODUCTION

Red-winged Blackbirds (*Agelaius phoeniceus*) form one of the most conspicuous elements of freshwater marsh avifauna in Mexico and Central

¹ Research Associate, Department of Ornithology, the American Museum of Natural History; Associate Professor, Department of Microbiology, Cornell University Medical College, New York City.

America south to western Costa Rica, as well as throughout North America. Since the last review of the redwings of Mexico and Central America (Hellmayr, 1937), four additional names have been proposed for sections of those populations, including *A. p. matudae* (Brodkorb, 1940), *A. p. pallidulus* (Van Tyne and Trautman, 1946), *A. p. brevirostris* (Monroe, 1963), and *A. p. nelsoni* (Dickerman, 1965). These populations are non-migratory and exhibit only minor movements.

In the course of research on the avifauna of the freshwater marshes, and in part during field work on the ecology of arthropod-borne viruses, 445 specimens of Red-winged Blackbirds were collected, including series from areas previously represented by few specimens. Most were collected from September to March, when in fresh to slightly worn plumage. These, together with somewhat more than 400 additional specimens available in museum collections, have permitted the first critical evaluation of geographic variation within the population of the Gulf of Mexico-Caribbean and Pacific (from Nayarit southward) coastal lowlands and of those from the interior south of the Trans-Mexican Volcanic Belt. Series of the all-black female populations without stripes of the Mexican Plateau called *A. p. gubernator* and of the female populations with stripes both dorsally and ventrally of northwestern Mexico are still inadequate to permit proper evaluation of their geographic variation and taxonomic relationships.

The present revision is largely based on color characters of adult females in fresh to slightly worn basic plumage or immature females just completing the first prebasic molt. Because of regional variation in timing of the nesting season and thus of the prebasic molt, specimens taken in January–February in one region are relatively little worn, whereas birds taken in the same month in another area are too worn to be of value for making color comparisons. Many immature females collected in mid-winter before the skull was completely “ossified” were too worn to make color comparisons. Adult males and usually only adult females were measured. Wing and tail measurements were not taken on females collected after March (or occasionally late April) or on males collected after May. After those periods wear is so great that measurements are not reliable. The age of females was determined by the extent of skull ossification and a series of other characteristics, including distinctness of ovules in the posterior lobe of the ovary into midwinter, presence of reddish feathers at the bend of the wing, shape and wear of rectrices, shape of alula, and general wear in comparison with known adults taken in the same series. Because most series were of sufficient size, birds of dubious age were usually not included in measurements. The tables include the minimal number of specimens examined, as immatures or very worn adults

were not always recorded unless further information was noted. Number of juveniles compared is recorded in the text. Bill measurements were taken with dial-vernier caliper. All measurements are in millimeters.

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GULF OF MEXICO AND CARIBBEAN COASTAL LOWLAND POPULATIONS

GENERAL CHARACTERISTICS: Smaller, with moderately long and more slender bills than Pacific lowland and southern interior populations. (See table 1 for measurements.)

Agelaius phoeniceus megapotaemus

Agelaius phoeniceus megapotaemus OBERHOLSER, 1919, p. 20 (Brownsville, Texas).

DIAGNOSIS: Females in fresh basic plumage much paler than adjacent *littoralis*; less reddish above, with ventral streaking heavier and blacker, and dull buff rather than rich ochraceous in breast and flanks as compared

with *richmondi*. Commonly with longer wings and shorter bill than in *richmondi*.

In Texas *megapotamus* is restricted to the lower Rio Grande Valley. Among a series of 18 molting immature females collected October 3–4 near Sinton, San Patricio County, there is much variation in dorsal color ranging from the pale buff of *megapotamus* to almost deep chocolate brown, indicating intergradation with *A. p. littoralis*, the coastal form to the north, in which the females are deeply colored. Likewise, one of two adult females in prebasic molt collected August 11 at Tivoli, Refugio County, is much darker than the other, indicating a population intergrading with *littoralis*. The interiormost Texas locality for *megapotamus* away from the Rio Grande is Cuero, DeWitt County (fig. 1).

In Mexico, *megapotamus* extends south through eastern Coahuila (Sabinas), Nuevo Leon, and Tamaulipas to northernmost north-central Veracruz. The exact southern limits of this form have not been well documented, but two fresh-plumaged females from Tampico and the adjacent marshes of northern Veracruz are only slightly more richly colored than females from Brownsville. The wing chords and tails are shorter and the bills are longer in birds from Mexico than in those from Texas; thus the Mexican birds approach *richmondi* in size (table 1). One somewhat worn female from Tecolutla, Veracruz, is intermediate in color toward *richmondi*.

Oberholser (1919) described *megapotamus* as being larger than *richmondi*. However, he presented measurements of only seven males of each form and of nine female *megapotamus*. Although *megapotamus* does average larger in wing and tail measurements, the bill is much shorter, so that wing length divided by bill length would probably give a valid separation. In addition there are excellent color differences. Birds from northeastern Mexico south to Tampico, although pale in color, average slightly shorter-winged.

Juvenal-plumaged *megapotamus* (three males, three females from southern Texas, Coahuila, and near Tampico) differ little from 13 juvenile *richmondi* in general cream to buff coloration, but are distinctly more heavily striped ventrally and on the crown. One juvenile male from Tecolutla has the edgings of the first basic interscapular feathers as richly colored as comparable feathers of *richmondi*, but has heavier and darker crown and ventral streakings than juvenal-plumaged *richmondi* and thus, like the adult female from Tecolutla, is intermediate between *megapotamus* and *richmondi*.

Agelaius phoeniceus richmondi

Agelaius phoeniceus richmondi NELSON, 1897, p. 58 (Tlacotalpan, Veracruz, Mexico).
Agelaius phoeniceus matudae BRODKORB, 1940, p. 548 (Palizada, Campeche, Mexico).

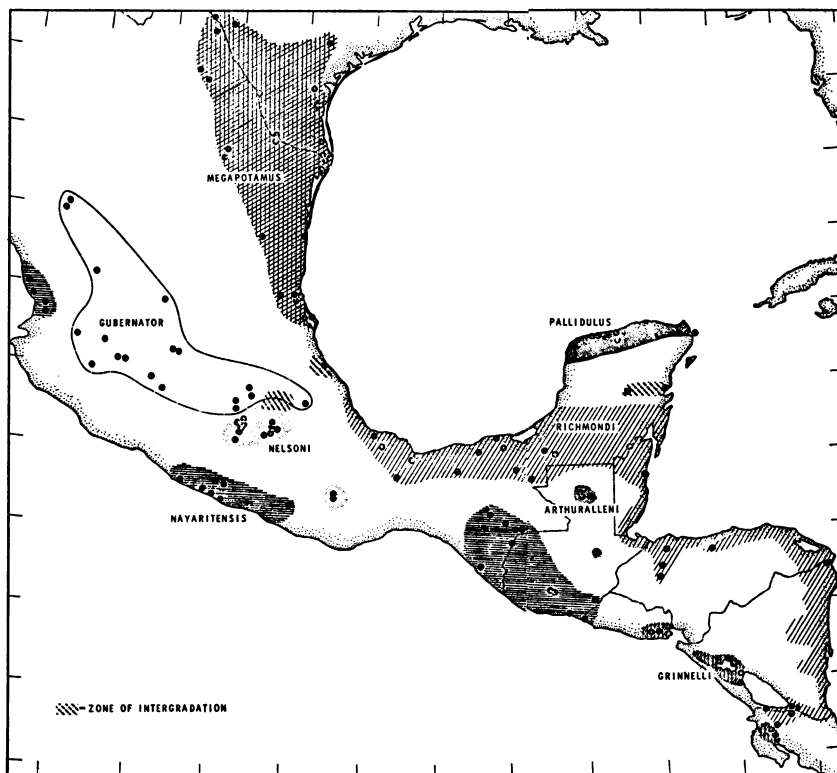


FIG. 1. Distribution of subspecies of the Red-winged Blackbird in Mexico and Central America.

Agelaius phoeniceus brevirostris MONROE, 1963, p. 6-7 (4 mi. N of Rio Lindo, Cortez, Honduras).

DIAGNOSIS: Dorsally reddest of all races of the species and richest ochraceous on breast and flanks. Ventral striping narrow and pale.

The range of *richmondi* is essentially as given by Hellmayr (1937). It occurs on the Gulf coastal lowlands of central Veracruz (Mexico) south across the base of the Yucatan Peninsula, through British Honduras, probably across the Caribbean coastal areas of Guatemala whence no specimens are available (but not in the interior of the Department of Peten), through northern Honduras to southeastern Nicaragua (San Carlos) and adjacent parts of Costa Rica (Los Chiles). The possible range of *richmondi* in eastern Nicaragua (fig. 1) was plotted based on altitude and rainfall.

Agelaius phoeniceus matudae Brodkorb, 1940, was described from birds taken in May and July as being smaller than *richmondi*, with females less reddish brown above, much whiter, less buffy below, and with a more distinct medial crown stripe. A series of seven females taken in September and November from Tabasco and Campeche is inseparable in color from a large series from Tlacotalpan, Veracruz, except in the paler ventral coloration of some individuals, indicating intergradation toward the paler Yucatan form *pallidulus*. Only four adult females and three adult males suitable for measuring are available. Wing and tail measurements of these, plus larger series of bill measurements from specimens in worn plumage fall well within the range of variation of *richmondi* (table 1). The smaller size and color characters of the type series of *matudae* can be attributed to wear and fading. Wetmore (1943), basing himself on measurements and color comparisons of worn birds from Tabasco, did not recognize *matudae*. Friedmann (1957) and Blake (1968), apparently following Wetmore, synonymized *matudae* with *richmondi*.

Agelaius phoeniceus brevirostris Monroe, 1963, was described as "having a shorter bill (especially noticeable in the male in which there is no overlap in measurements between *brevirostris* and *richmondi*) and in the female in averaging more yellowish and in being less distinctly streaked in the breast region" (Monroe, 1963, p. 6). Measurements of nine males and eight females of *brevirostris*, and of bills of only 10 males and four females of *richmondi* were presented, although the latter form was then well represented in collections. In the same publication series in describing *A. p. nelsoni*, Dickerman (1965) presented measurements of 21 male and 18 female *richmondi*, all from, or within 90 miles south of, the type locality. Those showed complete overlap with the published measurements of *brevirostris*; indeed, measurements of the shortest billed birds of both sexes of *richmondi* were smaller than the smallest *brevirostris*. Later Monroe (1968, p. 354) somewhat inexplicably wrote, "Specimens of *richmondi* from Veracruz exhibit wider range of variation in bill size than those from farther south (Tabasco to British Honduras); perhaps there are two recognizable subspecies in the taxon now known as *richmondi*." Howell (1964) also had pointed out that birds from the Caribbean slope of Nicaragua have longer bills than the original series of *brevirostris*.

Although there is a slight cline toward smaller size in the southern end of the range of *richmondi* in Honduras, it is barely, if at all, discernible between Veracruz and "Tabasco to British Honduras" (table 1); Monroe's size characters were apparently based on too small a series. Also, no color characters could be discerned when 15 fresh to slightly worn females from Honduras (including two from the type series) were compared with a

series of 19 *richmondi* from Veracruz and Tabasco. Actually *brevirostris* females tend to be slightly more streaked (or more obviously so) on the nape area and have slightly more extensive pale edgings on feathers of the interscapular area, but both of these characters are matched by some Veracruz specimens, and they are not consistent enough to maintain the form, neither could a series of six stubby-tailed to fledged but unworn juvenal plumaged *brevirostris* from northeast Honduras be separated from seven comparable juvenile *richmondi* from Tlacotalpan. Blake (1968), however, recognized *brevirostris*.

Agelaius phoeniceus pallidulus

Agelaius phoeniceus pallidulus VAN TYNE AND TRAUTMAN, 1946, pp. 1-3 (3 km. S of Progreso, Yucatan, Mexico).

DIAGNOSIS: Most similar to *megapotamus* but slightly warmer buff (less gray) on nape and with slightly heavier ventral streaking; paler than the Peten population with less heavy ventral streakings, paler (less richly colored) than *richmondi*.

Agelaius phoeniceus pallidulus occurs locally in freshwater marshes of the northern portion of the Yucatan Peninsula, and has been taken once on Isla Mujeres.

Paynter (1955) wrote: "I cannot recognize any difference in color between females from Yucatan and those from within the range of *A. p. richmondi* . . .," and Blake (1968) apparently following this, placed *pallidulus* in the synonymy of *richmondi*. Obviously those authors had not seen fresh plumaged birds of the two forms, which exhibit a comparable degree of difference as is found between *A. p. sonorensis* and *A. p. phoeniceus* or *Melospiza melodia saltonis* and *M. m. euphonia*. Actually if the range of *pallidulus* were contiguous with that of *megapotamus*, one would not describe the Yucatan birds.

Van Tyne and Trautman (1946) described *pallidulus* as being larger than *matudae* and *richmondi*, with the bill, especially in the male, more slender and attenuate and the culmen more rounded, less angular, in cross section. Although *pallidulus* is larger (longer winged) than *richmondi* and slightly smaller than *megapotamus*, these are only average differences. Moreover, the slenderer culmen of *pallidulus* is at best only an average difference in the male and, to me, undiscernible in the female.

Birds from the southern section of the Yucatan Peninsula, i.e., Camp Mengel and Laguna Chacanbacab, Quintana Roo, and possibly Vigia Chico, Quintana Roo, are closer in size to *richmondi*, although most of the specimens from these areas are too worn for color comparisons, and some too worn even for obtaining reliable measurements. One female (FM

121382) in good plumage from Pacaitun, in western Campeche, is pale. Griscom (1932), prior to the description of *pallidulus*, compared specimens from Quintana Roo and British Honduras and considered them to be *richmondi*. One female and four males from Isla Cozumel, collected in May, 1885, by Gaumer are in the British Museum (Natural History). Their wing measurements taken by Allan R. Phillips were: female 94; one male with an original label 110; and the three remaining males 110–115. The female had completed the prealternate molt and was noted to be paler and browner, with less and duller black on crown and underparts; the upper back was less deep chestnut than that of *richmondi* of comparable age. Thus the Cozumel birds are intermediate in character. Only a single male is known from Isla Mujeres.

Three full-grown but clean and apparently not badly faded juvenile *pallidulus* (PM 14026 ♂, 14027 ♂, and 14031 ♀) differ from *richmondi* as do juvenile *megapotamus*, that is, they have heavier ventral and crown streakings. The *pallidulus* are slightly paler (whiter) ventrally than *megapotamus*, but this may in part be a factor of age of the juveniles examined.

It is interesting to note that, like *Cassidix* (Dickerman and Phillips, 1966), the Yucatan population of *Agelaius* is more similar to the form in southern Texas and northeastern Mexico than it is to the adjacent form in Veracruz and British Honduras.

Agelaius phoeniceus arthuralleni, NEW SUBSPECIES

TYPE: Possibly adult female, AMNH 803755, Lago Peten Itza, Departamento Peten, Guatemala, collected February 20, 1968, by Robert W. Dickerman, original field number 14,026, weight 34.9 grams.

DIAGNOSIS: Female most similar to *pallidulus* but darker and more richly (warmly) colored both dorsally and ventrally, ventral streaking slightly heavier, also blacker. Differs from *richmondi* in being darker dorsally, less reddish, with much heavier, blacker streaking ventrally; buffy wash across breast less rich. Darker, more reddish, and smaller than the population of the Guatemala highlands. This diagnosis is based on the following series of females, all collected between September and February: 19 from Peten Itza, 13 from Honduras, 19 from Veracruz-Tabasco, and six *pallidulus* from near Progreso, Yucatan.

ETYMOLOGY: Named in honor of Dr. Arthur A. Allen, beloved teacher of ornithology, in recognition of his classical early studies of the Red-winged Blackbird.

Specimens have been examined from Lago Peten Itza, Laguna Perdida, and "L. El Solz" (=L. de Zolz). Griscom (1932) apparently without having examined specimens referred Peten records to *richmondi*. The one

female available from Panzos on the Rio Polochic, Guatemala, is also dark and nearest *arthuralleni*. Unfortunately no other material is available from the Caribbean coastal areas of Guatemala.

Two juvenile females well into the first prebasic molt collected at Laguna Perdida September 12, 1920 (UMMZ, 139290 and 139291) agree with the subspecific characters in having juvenal feathers of the lower abdomen with heavy dark stripes which are absent in *richmondi* juveniles. The fresh basic breast feathers of the Perdida birds are also more heavily striped than in series of fresh fall *richmondi*.

PACIFIC LOWLAND AND SOUTHERN INTERIOR POPULATIONS

GENERAL CHARACTERISTICS: Larger and with heavier bills than Gulf of Mexico and Caribbean coastal lowland populations (table 2).

Agelaius phoeniceus nelsoni

Agelaius phoeniceus nelsoni DICKERMAN, 1965, p. 2 (Lago Coatetelco, Morelos, Mexico).

DIAGNOSIS: Similar to *nayaritensis* but with longer wing and tail; much larger than *richmondi*. Females inseparable in color from females of *nayaritensis*, paler than females of *sonoriensis*, and less richly colored than females of *richmondi*, back having more contrast. Differing from geographically adjacent *gubernator* on the Mexican Plateau in females being striped below rather than uniform sooty gray to dull black, and in males having well-developed yellow border in epaulet in contrast to concolor red epaulet of *gubernator*. Longer billed than *gubernator*.

The principal range of *nelsoni* is as mapped previously (Dickerman, 1965): freshwater marshes, rice and sugar cane fields of Morelos and adjacent Pueblo, at Laguna Tuxpan, Guerrero, and in the Valley of Oaxaca.

Friedmann (1957) included "... Guerrero and Oaxaca (western part, intergrading with *A. p. grandis* in central part Mitla, K-d), Chiapas ... [and] Morelos ... " in the range of *A. p. gubernator*. I know of no reliably collected birds of the *gubernator*-type from any of those states. Friedmann's conclusions were probably in part based on a misconception of the characters of *gubernator* and *grandis* (= *nelsoni*) (but cf. Dickerman, 1965). A series of six females and six males in the R. T. Moore Collection taken by Mario del Toro Aviles labeled "Mitla" are indeed from a population with intermediate characters of *gubernator* \times *grandis* but obviously were not collected within at least 200 km. of Mitla. Marshall (1964) reported that the collector later "recalled" that the series of Brown Towhees also labeled "Mitla" were collected at Tepeaca, Puebla. The "Mitla" redwing series

might also have been from Tepeaca if the collector's memory is to be trusted more than his labels, but both are best ignored. Two of the three males from Oaxaca Valley have longer wings (131, 136, and 139) than *nayaritensis*.

Agelaius phoeniceus nelsoni appears to be a moderately aggressive form extending its range into areas occupied by other forms. Hardy and Dickerman (1965) and Dickerman (1965) described the extension of *nelsoni* into the range of *A. p. gubernator*. In a series of nine adult males, five adult females, and four measurable immature females of *nayaritensis* from Putla, Oaxaca, one male collected December 19 has wing-tail measurements of 135/105, another 131/98, and an immature female collected October 22, 107/77. These, I believe, indicate some degree of inflow of *nelsoni* genes into the Putla population, possibly through the settling down of immature male wanderers in a population not big enough to swamp out the "large size" characters.

In contrast to the situation found in the eastern lowlands the juvenal plumage of the populations of redwings on the Pacific lowlands show essentially no geographic variation, except for the generally paler coloration of juvenile *sonoriensis*. In ventral view three juvenile females from Costa Rica and El Salvador are inseparable from three from Nayarit, Mexico and inseparable in dorsal coloration when museum age and fading is considered. Juvenal-plumaged *nelsoni*, likewise, are inseparable in color from Nayarit birds. Thus Pacific coastal juveniles from south of the range of *sonoriensis* are of no help in separating races.

JUVENILES EXAMINED: *A. p. nelsoni*: Morelos, one female, six males; Guerrero, one female. *A. p. nayaritensis*: Nayarit, three females; Guerrero, one female; Guatemala, one female; Salvador, one [female]. *A. p. grinnelli*: El Salvador, two females, one male; Costa Rica, one female, one male.

Agelaius phoeniceus nayaritensis

Agelaius phoeniceus nyaritensis [sic] DICKEY AND VAN ROSSEM, 1925, p. 131 (Santiago Ixcuintla, Nayarit, Mexico).

DIAGNOSIS: Female darker and richer in color than *sonoriensis*; inseparable from *nelsoni* in color; both sexes significantly smaller than *nelsoni*, but larger than the Gulf and Caribbean lowland populations.

Agelaius phoeniceus nayaritensis has a range more than 1800 km. long, extending along the Pacific lowlands from Nayarit to western El Salvador and also occurring in the interior highlands of Chiapas and Guatemala. Considering the great geographic variation among redwing populations and more especially the two gaps in the range of *nayaritensis* (along the Mexican coast where the highlands meet the sea eliminating coastal

lowlands, in Colima and Michoacan, and again in Oaxaca, fig. 1), it is amazing to find females from the highlands of Guatemala inseparable in color from those of Nayarit. As mentioned above, Friedmann (1957) referred specimens from coastal Guerrero and interior Chiapas to *A. p. gubernator*. Following Friedmann, Alvarez del Toro (1958) listed the redwings from the highlands and later (1964) those from the Pacific lowlands as *gubernator*. Dickey and Van Rossem (1938) recognized specimens from the interior highlands of Guatemala as similar to *nayaritensis*, but identified a probably less worn male from Lake Olomega, El Salvador, as *nayaritensis* because of its larger size. Actually the wing chord of that individual (130 mm.) falls within the measurements of *grinnelli* and, in the absence of better information, *nayaritensis* should be considered sedentary as are the other southern forms of the redwing.

In contrast to *richmondi* there is not a north-south cline in size in *nayaritensis*. The only significant variation among those populations is the large size of the birds of interior Chiapas in all measurements. The birds from interior Guatemala are slightly smaller and thus intermediate with those from coastal Guatemala. The latter in turn are very similar in size to the series of topotypes from Nayarit. A series of 12 males and one female collected by Mario del Toro Aviles in March and April, 1947, are labeled Palma Real, Ococingo, a locality well down on the Gulf of Mexico slope of Chiapas. These specimens are large and certainly represent the Chiapas subpopulation of *nayaritensis* but obviously were collected on the interior plateau and not near Ococingo. Although the specimens are included in the measurement data the locality is not mapped in the present paper.

Agelaius phoeniceus grinnelli

Agelaius phoeniceus grinnelli HOWELL, 1917, pp. 196–197 (San Sebastian, El Salvador).
Agelaius phoeniceus costaricensis VAN ROSSEM, 1930, p. 162 (Bebedero, Guanacaste, Costa Rica).

DIAGNOSIS: Females dorsally similar to *nayaritensis*, but on the average redder on edges of interscapular feathers, rather than paler buff or duller brown (i.e., with less contrasting back); crown generally paler and bill slightly more slender; thus intermediate in dorsal coloration between *nayaritensis* and *richmondi* but less red than the latter. Ventrally, like *richmondi*, with paler and narrower streaking than *nayaritensis*. Less ochraceous on breast and flanks than *richmondi*. Similar in size to *nayaritensis*, larger than *richmondi*.

Agelaius phoeniceus costaricensis was described from a series taken mostly in June as similar to *grinnelli* but with wing and tail shorter and with females a darker brown above, more sooty (less grayish) on the lower

TABLE 1
MEASUREMENTS (IN MILLIMETERS) OF RED-WINGED BLACKBIRDS OF THE GULF OF MEXICO AND CARIBBEAN COASTAL LOWLANDS
(With mean and standard deviation.)

	Males			Females		
	Wing	Tail	Culmen from Nostril	Wing	Tail	Culmen from Nostril
<i>A. p. megapolaris</i> Texas	112-120	86-99	14.1-16.8	90-103	64-77	12.4-13.8
	116.4(2.3)	90.9(3.2)	15.3(0.8)	96.1(3.0)	72.7(3.1)	13.0(0.5)
	n=20	n=20	n=23	n=14	n=14	n=21
	111-119	87-93	15.3-19.7	90-98	69-75	12.6-14.6
NE Mexico	115.2(2.3)	90.3	16.8(1.0)	94.4(2.5)	69.7(2.9)	13.7(0.6)
	n=10	n=10	n=22	n=13	n=13	n=19
<i>A. p. richmondi</i> Veracruz	104-118	81-98	15.4-19.0	84-94	61-73	13.2-15.7
	111.2(3.2)	87.0(4.2)	17.7(0.9)	88.4(2.4)	67.3(2.9)	14.7(0.6)
	n=21	n=19	n=22	n=18	n=13	n=19

TABLE 1—(Continued)

	Males		Females		Culmen from Nostril
	Wing	Tail	Wing	Tail	
"matudae"	110-112	84-87	88-92	69-74	13.5-15.0
	111.0 n = 3	86.0 n = 3	89.8 n = 4	70.0 n = 4	14.4(0.6) n = 9
British Honduras and Caribbean	109-115	83-90	85-91	66-71	13.3-14.8
	111.1(2.1) n = 7	86.7(2.7) n = 7	88.6(2.1) n = 8	68.0(1.8) n = 7	14.1(0.4) n = 8
Guatemala "brevirostris"	106-113	81-89	81-90	64-72	13.4-15.0
	109.4(2.2) n = 14	89.2(2.7) n = 11	86.3(2.6) n = 14	67.0(2.9) n = 10	14.3(0.5) n = 18
<i>A. p. arthuralleni</i>	105-114	81-96	87-93	66-73	12.0-15.5
	109.9(2.7) n = 13	87.7(4.6) n = 11	89.3(1.5) n = 19	69.3(2.2) n = 19	14.5(0.7) n = 18
<i>A. p. pallidulus</i>	112-120	83-93	89-94	67-76	12.9-15.3
	114.0(2.1) n = 18	87.7(2.9) n = 17	92.4(2.0) n = 12	70.8(2.4) n = 12	13.8(0.6) n = 18

TABLE 2
MEASUREMENTS (IN MILLIMETERS) OF RED-WINGED BLACKBIRDS OF PACIFIC COASTAL LOWLANDS AND
INTERIOR HIGHLANDS SOUTH OF THE TRANS-MEXICAN VOLCANIC BELT
(With mean and standard deviation.)

	Males			Females		
	Wing	Tail	Culmen from Nostril	Wing	Tail	Culmen from Nostril
<i>A. p. nelsoni</i> ^a	133-143 139.3(3.0) n = 14	99-109 103.5(3.0) n = 20	15.9-17.9 16.9(0.6) n = 20	106-115 109.9(2.3) n = 28	75-86 80.4(2.6) n = 28	12.7-14.8 14.1(0.7) n = 33
<i>A. p. nayaritensis</i> Nayarit	122-130 125.8(1.9) n = 16	92-110 95.6(3.0) n = 9	15.3-18.2 16.7(0.8) n = 16	100-110 103.9(3.0) n = 18	75-81 77.8(1.9) n = 18	12.5-15.3 14.0(0.8) n = 18
Coastal Guerrero	123-131 127.7(2.4) n = 23	91-102 96.4(2.7) n = 23	15.5-18.3 16.7(0.7) n = 30	94-107 100.7(3.3) n = 25	68-80 75.0(3.8) n = 22	12.1-15.5 13.8(0.7) n = 30
Coastal Chiapas	— — —	— — —	— — —	96-103 99.8(1.9) n = 26	70-80 75.1(2.4) n = 26	12.8-15.0 14.0(0.6) n = 26
Interior Chiapas	126-139 130.5(3.4) n = 33	95-104 99.2(2.8) n = 34	16.5-19.5 18.0(0.8) n = 31	101-112 103.8(2.4) n = 40	75-87 79.1(2.7) n = 39	15.3-16.0 14.5(0.7) n = 36

TABLE 2—(Continued)

	Males			Females		
	Wing	Tail	Culmen from Nostril	Wing	Tail	Culmen from Nostril
Interior Guatemala	123-133 128.8(3.9) n = 5	95-99 97.0(1.6) n = 5	16.8-17.1 16.9(0.2) n = 5	98-104 101.6(2.4) n = 14	67-81 75.0(4.2) n = 14	121-14.0 13.2(0.5) n = 14
Coastal Guatemala	123-131 125.8(3.6) n = 8	93-100 95.7(2.0) n = 6	16.1-17.7 17.0(0.5) n = 8	95-104 100.3(2.6) n = 21	70-79 75.2(1.9) n = 21	12.5-14.3 13.4(0.4) n = 22
<i>A. p. grinnelli</i>						
El Salvador	119-132 124.9(4.0) n = 8	— — —	16.6-18.5 17.7(0.7) n = 11	93-102 98.1(2.9) n = 15	72-83 77.2(2.9) n = 13	12.7-15.0 14.0(0.6) n = 17
Nicaragua	121-127 123.1(2.0) n = 11	92-100 95.3(2.6) n = 11	15.9-17.5 16.9(0.6) n = 9	— — —	— — —	— — —
Costa Rica	115-123 119.7(2.1) n = 25	88-96 91.9(2.6) n = 16	15.2-17.8 16.3(0.8) n = 25	90-97 93.1(2.0) n = 16	61-74 69.5(3.2) n = 15	12.4-14.6 13.4(0.5) n = 21

^aData for Morelos-Guerrero population from Dickerman, 1965. An additional 51 males taken in spring and summer from Morelos have wing chords ≥ 130 , the maximum measurement of *A. p. nayariensis*.

abdomen region and under tail coverts. All these characters are largely those of worn breeding specimens.

Howell (1964), albeit also using material considered in the present study to be too worn to provide accurate measurements, demonstrated that *costaricensis* is inseparable in size from *grinnelli*. Measurements of unworn specimens bear out his conclusions (table 2). He also made preliminary color comparisons of females but concluded fresh plumage of specimens from Costa Rica were needed to resolve the question of the validity of *costaricensis*. Actually females from Costa Rica collected in January and February were available in 1964, but the only female *grinnelli* were taken in March or later and were rather worn. However, although a series of unworn females collected in February, 1968, at Laguna Jocatal, El Salvador, show slight differences, they are not consistently separable in color from females from Guanacaste, Costa Rica, collected in February, 1967, and until larger, fresh series are available, they support Howell's conclusion. The birds of Costa Rica do average slightly smaller in size, and, I note, do tend toward a darkening or reddening of coloration, possibly in an approach toward *richmondi*, as Howell (1964) suggested might be the case. However the darkest (although brownest) bird in the series is from El Salvador, and the slightly more worn birds of Costa Rica are more similar to the El Salvador series. On the Pacific lowlands of Nicaragua Red-winged Blackbirds are more widely distributed than is presently recorded by specimens. In August, 1972, redwings were seen by the author near Chichigalpa, in the westernmost Department of Chinandega. A female taken April, 1905, from San Emilio Rivas, Nicaragua, cannot be identified on the basis of color because of loss of subspecific characters through wear, but the short wing (87) and tail (65), and moderately long bill (13.8) are diagnostic for the smaller eastern lowland population of *richmondi*. The single available worn-plumaged male collected August 2 from Laguna El Arenal in the Caribbean slope of Guanacaste Department of Costa Rica apparently represents *richmondi*, based on its small size (wing chord 112).

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