

ON THE SIERRA MADRE SPARROW, *XENOSPIZA BAILEYI*, OF MEXICO

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THE Sierra Madre or Bailey's Sparrow, *Xenospiza baileyi*, was described as a new genus and species from the high mountains of Durango and Jalisco less than 35 years ago (O. Bangs, *Proc. New England Zool. Cl.*, 12: 85-88, 1931). It has since been considered rare, and even 19 years ago, when F. A. Pitelka (*Condor*, 49: 199-203, 1947) described a new subspecies, only 11 specimens were known, of which he had at hand only 1 from La Cima, Distrito Federal, and 3 from western Mexico. Today the population from the sacaton bunch grass areas of La Cima, in the pass between the Valley of Mexico and Cuernavaca, is well represented by series in the collections of Phillips and the University of Minnesota Museum of Natural History. These series include specimens in all the plumage stages from stubby-tailed juveniles to worn adults and those having recently completed the prebasic molt. Other specimens are scattered through several museums in the United States. The population of Durango is now represented by additional specimens in the collection of the Robert T. Moore Laboratory of Zoology, Occidental College. With the accumulation of this material, and notes from several seasons' field work by the authors, it is a propitious time to gather together the information on this restricted endemic Mexican sparrow.

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TAXONOMIC AND MORPHOLOGICAL CONSIDERATIONS

North American ornithologists have long used the convenient terms "sharp-tailed sparrows" and "grassland-nesting sparrows" to denote species currently in the genera *Passerculus*, *Ammodramus*, *Passerherbulus*, and *Ammospiza*.¹ If these four genera were to be combined they would take the name *Ammodramus*. In comparison with these, for the sake of con-

¹A review of the close relationships within this complex is being presented elsewhere as will also be a description of a hybrid *Passerculus sandwichensis* × *Ammodramus savannarum*.

TABLE 1
MEASUREMENTS OF *XENOSPIZA BAILEYI*¹

Measurement	Males		Females	
	La Cima	Jalisco and Durango	La Cima	Jalisco and Durango
Weight (g)	22 15.8-18.8 (17.7) (0.4)	-	5 16.2-19.0 (17.9)	-
Length (mm)	15 140-152 (146.2) (3.3)	-	1 146	-
Extent (mm)	16 205-221 (218.8) (3.9)	-	1 198	-
Wing chord (mm)	28 60-66 (63.9) (1.4)	6 61-64 (62.7)	5 58-63 (60.4)	3 59, 59, 62 ²
Tail (mm)	28 53-58 (55.8) (1.3)	6 52-56 (54.7)	4 50-54 (51.8)	3 49, 49, 57 ²
Tarsus (mm)	28 18.8-21.0 (19.8) (0.7)	6 19.0-19.7 (19.3)	4 19.0-20.7 (20.0)	3 18.5, 19.5, 19.6 ²
Culmen from nostril (mm)	30 7.2-8.1 (7.7) (0.4)	6 7.4-8.0 (7.7)	4 7.4-7.9 (7.7)	3 7.7, 8.0, 7.1 ²
Depth of bill (mm)	19 5.7-6.3 (6.1) (0.1)	5 5.4-6.1 (5.8)	4 5.8-6.4 (6.2)	3 5.4, 5.8, 5.8 ²

¹ The respective values are: N, extremes, mean, and (where appropriate) standard deviation.

² Measurements of the three specimens from Jalisco and Durango given individually, the third entry being that of the type X. b. *sierrae*, USNM 356548, as given by Pitelka (1947).

venience in this discussion, we use the term "brushland-nesting sparrows" for the closely related species now in the genera *Passerella*, *Melospiza*, *Zonotrichia*, and *Junco*. L. L. Short and S. W. Simon (*Condor* 67: 438-442, 1965) have recently presented the evidence of the relationships within this group with the tentative suggestion that the genera be all combined and the bear name *Junco*.

In naming *Xenospiza baileyi sierrae*, Pitelka (*op. cit.*) compared his April specimen with three comparably plumaged specimens of the northwestern population *Xenospiza b. baileyi*, from Jalisco and Durango. He characterized the *sierrae* as: a number having blacker, broader spots on the breast, with a medial cluster as in *Melospiza melodia*; the malar streak blacker and more prominent; the streakings on the sides of the belly blacker; the sides of the head grayer; the crown blacker with narrower brown feather margins; and the bill blacker dorsally. He thought that *sierrae* was composed of larger birds than was the northern population.

In the present study we have compared in detail 17 specimens of *sierrae*, including the type, with 7 specimens of *baileyi*, including the type. In worn specimens, we found complete overlap in all characters cited by Pitelka. The breast spots of some *sierrae* are less well developed than in *baileyi* (taking wear into consideration). The specimens of the latter form examined in detail have more or less well developed concentrations of breast spots, whereas three of the *sierrae* have no central concentration of black. The malar stripes on at least three *sierrae* are less well developed than in *baileyi*. Dorsally, *sierrae* averages slightly darker russet brown, less richly colored, with slightly more extensive central black areas of the back feathers; there is, however, much overlap. The russet brown of the interscapular area of the type of *sierrae* is actually slightly paler than it is in the type of *baileyi*. The crowns and sides of the heads are not appreciably different in the worn series. There are no differences in the color of the bills in dried specimens, nor are there significant size differences (Table 1).

Specimens of *Xenospiza* are grossly reminiscent of some forms of *Melospiza*, and Pitelka (*op. cit.*) wrote that a survey of some generic characters among the sparrows which had been linked with *Xenospiza* in the literature caused him to doubt that *Xenospiza* should be segregated as a distinct genus. He thought that it was closely related to *Melospiza* and that it was possibly a member of that genus. However, Pitelka used characters of adult external morphology, such as wing and bill size and proportions and extent of ventral streaking, which are notoriously variable even intraspecifically among certain North American sparrows. We think that the following data on the nest, eggs, juvenal and fresh basic (autumn) plumages, song, and behavior provide a more reliable basis for evaluating the systematic relationships of this elusive sparrow.



Figure 1. Nesting habitat of *Xenospiza baileyi*, near La Cima, Mexico, D. F., 25 July 1957.



Figure 2. Nest and young of *Xenospiza baileyi*, near La Cima, Mexico, D. F., 25 July 1957.

HABITAT, NEST, AND EGGS

The habitat (Figure 1) of *Xenospiza* is a primary association of medium and tall bunch grasses, *Epicampes macrura*, *Festuca amplissima*, *Stipa ichu*, and *Muhlenbergia affinis*, interspersed with park-like stands of *Pinus montezumae* on the ridges and knolls. Bushes are absent in the grassland areas. In the period since 1954, when Phillips and Warner first collected in the La Cima area, a large portion of the tillable area of this habitat has been plowed and destroyed as nesting cover. Approximately 25 to 35 per cent of the habitat visited by the authors has been destroyed in this time span.

The fields are used as feeding areas by the birds to a varying degree during the year. The gizzard of one adult taken 20 November contained a fine gravel, small Coleoptera of the family Tenebrionidae, and the remains of a small spider.

Our knowledge of the nest of *Xenospiza baileyi* dates from 12 July 1954, when Warner discovered an adult at a thick-walled, unlined cup nest, near, but not on, the ground between clumps of bunch grasses. On 25 July 1957, Warner and Dickerman observed adults feeding young several days old in a nest in a similar location (Figure 2). This nest was later collected. On 15 September 1961, Phillips and Dickerman found an abandoned nest



Figure 3. Two nests of *Xenospiza baileyi*, collected at La Cima, Mexico, D. F., 31 July 1962. The nest on the right was abandoned.

containing one punctured egg, in the middle of a clump of bunch grass about a foot above the ground level, and on 31 July 1962 they collected an adult female with her nest and three slightly incubated eggs. This nest was located in a clump of low grasses close to the ground between larger bunch grasses. In the edge of a clump of bunch grass within six feet of this active nest, Phillips found another nest, abandoned, of the species.

The outer shells of the four nests which were collected are constructed of moderately coarse grass with a few forbs (Figure 3). The nests are lined with fine grass and grass rootlets, and small amounts of horsehair.

When fresh, these nests measured: cup diameter, 55 to 70 mm; cup depth, 42 to 48; outside diameter, 100 to 115; outside depth, 85 to 95. The four eggs measured 19.3×14.2 , 20.0×14.5 , 20.1×14.6 , and 20.6×14.5 mm, the first three being in the same nest.

The three slightly incubated eggs are pale greenish blue in color, between, but paler than Pale Nile Blue and Etain Blue of R. Ridgway (*Color standards and color nomenclature*, Washington, D.C., 1912); the fourth egg from the abandoned nest is much faded. The eggs have fine spots and flecks, burnt umber to blackish in color, in a wreath around the larger end with occasional spots scattered over the entire shell. The eggs of *Xenospiza* resemble those of all the North American sharp-tailed, grassland nesting sparrows in having dark, nearly black, spotting, in contrast to the reddish spotting of the eggs of all species of the brushland nesting sparrows in which the eggs are spotted. However, the eggs of none of the other grassland sparrows have a blue-green ground color, whereas this is occasionally found in the brushland-nesting group.

JUVENAL PLUMAGE

Juveniles of the species were first collected by Warner and Phillips in June, 1954. We now have 10 specimens in juvenal plumage. Stubby-tailed young were taken 13 June and 4 August. Young taken 3 September ranged from birds with fresh, little-worn juvenal plumage to others well into the first prebasic molt with their interscapular areas largely in the first basic plumage. The juvenal plumage, like the basic plumage, is, upon gross examination, similar to the corresponding plumages of *Melospiza*. However, detailed examination reveals this to be, in our opinion, a misleading impression. On analysis this plumage, when not worn or faded, presents closer similarities to the grassland nesting sparrows. Ventrally, juvenal *Xenospiza* are weakly and variably streaked in a band across the breast and along the sides of the throat and breast, much as are many young Emberizinae (Figure 4). The streaks tend to concentrate into a submalar streak in some individuals. The underparts have a warm, pale buffy cast throughout, similar to that of juvenal Henslow's Sparrows

(*Passerherbulus henslowii*) and (Nelson's) Sharp-tailed Sparrows (*Amospiza caudacuta nelsoni*). This fades and wears rapidly, but even young which are worn retain a creamy cast below rather than becoming whitish, as do young of the *Junco* complex which are worn. The flanks and under tail coverts are a deeper buff than the breast and belly regions.

Dorsally, a stubby-tailed juvenal (ARP original no. 3486) is superficially similar in general appearance to a stubby-tailed juvenal Lincoln's Sparrow, *Melospiza lincolni*, from Apache County, Arizona, but is darker. In contrast, a full-grown, unworn, juvenal-plumaged *Xenospiza* is approximately intermediate in dorsal pattern between juvenal *Passerculus sandwichensis brunnescens* (Savannah Sparrows) and *Passerherbulus henslowii*, though slightly darker than either; it is quite distinct from a comparably aged *M. lincolni*. Juvenal *Xenospiza* have broad, central, black, shaft streaks above; those are edged with olive brown to olive buff, richer on the scapulars and interscapulars, and grayer on the nape, but exhibiting considerable individual variation. The edges of the tertials and remiges are ochraceous brown. Crown stripes are not well differentiated. The superciliary line is rich buffy, becoming yellow in front of the eye. The most striking character is the presence of more or less well developed "scalloping" on the tips of dorsal contour feathers, much as in the young of the grassland sparrows and immediately separating the young of *Xenospiza* from those of the *Junco* assemblage (Figure 4).

BASIC PLUMAGE

The freshly molted basic plumage of *Xenospiza* is now represented by an adult in prebasic molt taken 15 September and by four specimens taken 20 November. The worn condition of this plumage differs so greatly from the unworn condition as to have apparently misled Pitelka into considering *Xenospiza* to be most similar to *Melospiza*. If he had had these fresh specimens he almost certainly would have hesitated to contest Bang's (*op. cit.*) inclination to align *Xenospiza* with the grassland sparrows. The interscapular region of *Xenospiza*, like that of Le Conte's (*Passerherbulus caudacutus*), Henslow's, Baird's (*Ammodramus bairdii*), and Grasshopper (*A. savannarum*) sparrows, is heavily scalloped dorsally, contrasting markedly with any species of the *Junco* assemblage. The interscapulars of the fresh basic plumage are indeed longer in *Xenospiza* than in the brushland sparrows by actual measurement. As stated by Bangs in the original description of *Xenospiza*, long interscapulars are apparently a characteristic of the grassland sparrows. In two characters Pitelka's comparison with Lincoln's Sparrow is apt. First, the fresh plumage of the cheek is quite similar in the two species, with a buffy subauricular region. However, this color is present in the *Junco* (brushland) complex only in

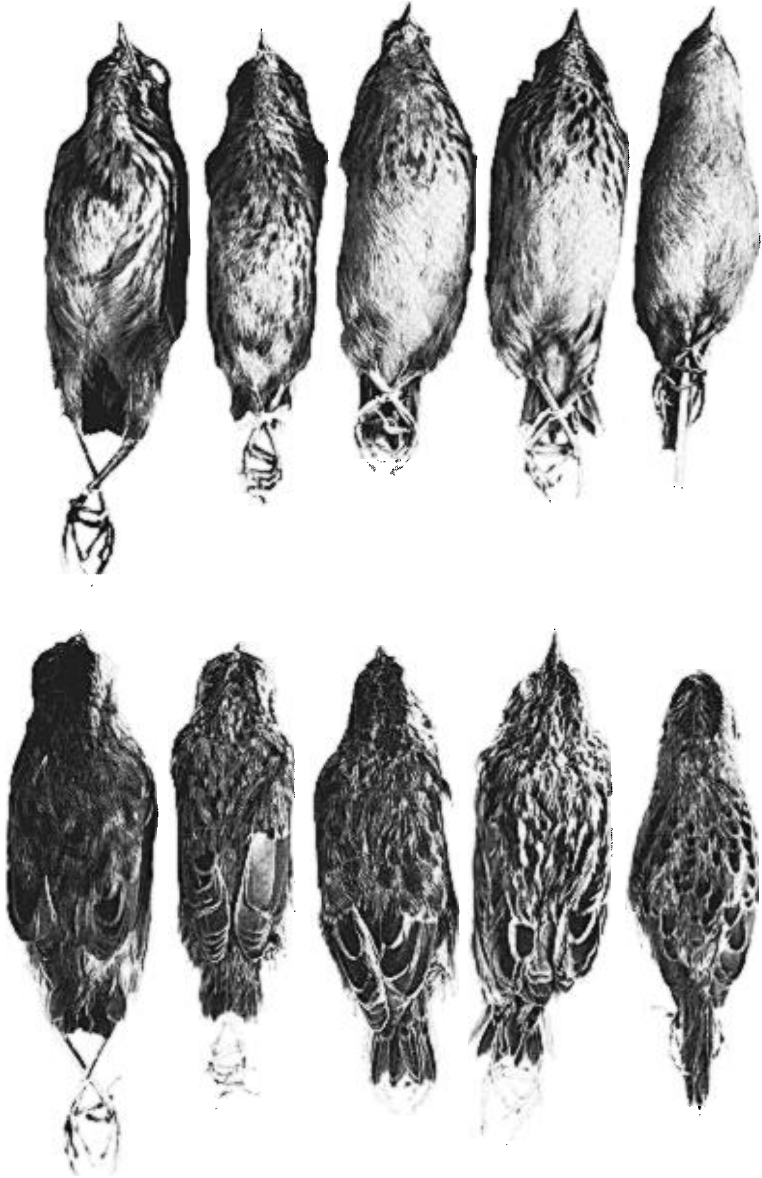


Figure 4. Ventral and dorsal views of sparrows in juvenal plumage. Left to right: *Melospiza melodia*, *M. lincolnii*, *Xenospiza baileyi*, *Passerculus sandwichensis*, and *Passerherbulus henslowii*.

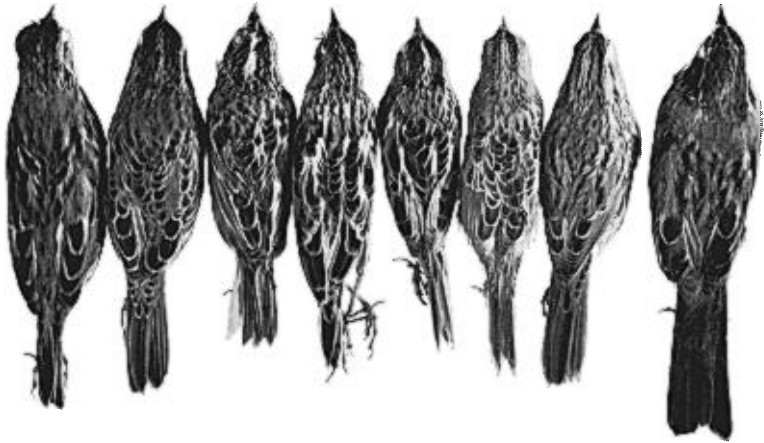


Figure 5. Sparrows in fresh basic (autumn) plumage, showing the similarity of *Xenospiza* to the sharp-tailed sparrows. Left to right: *Passerculus sandwichensis*, *Xenospiza baileyi*, *Ammodramus savannarum*, *A. bairdii*, *Passerherbulus caudacuta*, *P. henslowii*, *Melospiza lincolni*, and *M. melodia*.

lincolni, whereas the same character is present in all of the grassland sparrows. Secondly, the crown stripes are not dissimilar to those of the Swamp Sparrow, *M. georgiana*. Ventral streaking of *Xenospiza* is reminiscent of the *Melospiza* condition, although hardly more so than that of the more blackly streaked races of Savannah Sparrow. The bend of the wing is yellow, as in most of the grassland sparrows, in contrast to the usually white bend of the wing in the brushland complex (although it is yellow in some forms of *Zonotrichia*). The tail shape in adult (second basic or later) plumage is far less strongly double-rounded and the rectrices are more acutely tipped than illustrated by Pitelka, whose type is apparently in first basic plumage with a worn tail showing a more double-rounded condition.

MOLT AND SOFT PARTS

The first prebasic (postjuvinal) molt is incomplete, involving only the body and wing coverts, excepting the outer greater primary coverts which, at least, were retained by our one fall immature specimen. This molt apparently begins in some individuals in middle July and extends through September or beyond in others. We have no specimens taken between 3 September and 20 November; however, as noted before, young taken 3 September wore plumage varying from a fresh, little-worn juvinal plumage to the mixed plumage of individuals well into the prebasic molt. Judging from a male taken 21 May, there is, at least in some individuals, a partial prealternate molt involving the chin and malar area as there is in so

many sparrows. Pitelka did not mention evidence of a prealternate molt on the April birds he examined, nor did Dickerman find it on two April specimens he collected.

Soft part colors, of four juvenal-plumaged birds, as recorded in the field by Phillips, were as follows: iris, grayish brown to dark brown; maxilla, drab to dark drab; mandible, drab with base paler and with tomia paler, buffy to ochre-tinged, especially basally; gonys, ochre-tinged; mouth, pale flesh to reddish; maxillary palate, yellow; tarsi and toes, flesh-colored to darker, more drab, especially toes in older young. Soft part colors of two adult males taken in June were; iris, grayish brown; bill, dusky bluish gray below, buffy at and before gonydeal angle; tarsi, buffy flesh to pale buffy drab, paler inside; toes, darker, especially joints, varying to drab.

SONG AND BEHAVIOR

The song of *Xenospiza* is highly variable. From notes taken in the field over several seasons since 1954, the song may be summarized as often beginning with two to three (or even more) "signal" notes as in the Song or Savannah sparrows, but these are never clear and ringing as in the former. The remainder of the song varies greatly but generally contains a buzzing series of notes best expressed by "tzee" or "zhip" or a scratchy "jeep." These may be higher and lower alternately or on an ascending scale. Resemblance may be claimed to portions of the songs of a number of species but, except for the signal notes, not to those of the Song Sparrow. It is unfortunate that, in spite of the ease of access to the *Xenospiza* habitat, good recordings have not been made for spectrographic analysis. We have never yet heard a song resembling that attributed to this species by H. O. Wagner (*in* Pitelka, *op. cit.*; quoted by E. R. Blake, *Birds of Mexico*, Chicago, Univ. Chicago Press, 1953; p. 589).

It is interesting to note that Alfred M. Bailey, who made the first field notes on this species, compared its behavior with that of the Seaside (*Amospiza maritima*) and Savannah sparrows (pers. comm. and *Nat. Hist.*, 35: 255, 1935). We find its behavior most like that of the Grasshopper, or, possibly, the Sharp-tailed Sparrow. In the spring and summer, males are conspicuous, singing from tall grass or even telephone wires. At this time an occasional alarmed bird may even perch in a pine tree. At other seasons of the year, however, they are highly secretive. They are difficult to flush and, upon dropping back into the grass, often run, much in the manner of Sharp-tailed Sparrows, and reflush (if at all) at some distance from the place where they alighted.

GENERIC RELATIONS

The information presented above leads us to think that *Xenospiza* should occupy a systematic position close to the other grassland-nesting

sparrows, as recommended by Bangs (*op. cit.*) and followed by C. E. Hellmayr (*Field Mus. Nat. Hist., Zool. Series*, vol. 13, pt. 11, 1938; see pp. 503–504), and not close to *Melospiza*, of the brushland sparrows, as recommended by Pitelka (*op. cit.*) and A. H. Miller *et al.* (*Pacific Coast Avif.*, no. 33, 1957; pp. 396–397). The exact position within this group is less obvious. Bangs (*op. cit.*) thought it to be closer to *Passerherbulus caudacutus*; Warner, in a paper read at the 1956 meeting of the American Ornithologists' Union, discussed it in relation to *Passerculus sandwichensis*; and Mayr (pers. comm.) considered it closer to *Passerherbulus henslowii*.

Xenospiza may have arisen from the same basic stock as the grassland sparrows, yet early enough to be, in some respects, intermediate towards the *Junco* or brushland complex. Whether it is to be combined nomenclaturally with the grassland sparrows in an enlarged genus *Ammodramus*; or be retained as a monotypic genus may never be settled by a decision better than arbitrary. We think at present it is best retained as a monotypic genus placed between the genera *Ammodramus* (enlarged to include most of the grassland sparrows) and *Junco* (enlarged to include most or all of the brushland sparrows).

SUMMARY

Xenospiza baileyi sierrae from the region of Mexico City is not a recognizable subspecies. Characters of the unworn basic and juvenal plumages, the eggs, and songs suggest that *Xenospiza* is more closely related to the sharp-tailed, grassland-nesting sparrows of the *Ammodramus* complex rather than to the brushland-nesting sparrows of the *Junco* complex.

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