



FIGURE 1. Typical natal pterylosis of *Amphispiza* sparrows: A—*A. bilineata*, B—*A. belli*. Each dot represents a single neossoptile. The pelvic region neossoptiles are in an unpaired row on the midline in both species.

1967) and House Finch (*Carpodacus mexicanus*; Collins and Bender 1977a), when the total number of neossoptiles was greater, extra downs tended to be present on additional tracts or exceptional pterylae. This appears to be true in *Amphispiza*, particularly in *bilineata*. One specimen of *bilineata* had the neossoptiles on the femoral tract arranged in double rows on each side, an extreme case of intraspecific variation.

The pattern of neossoptile distribution in *Amphispiza* (Fig. 1) appears generally similar to that which Wetherbee

(1957) reported for a variety of fringillids (including Carduelinae, Cardinalinae, and Emberizinae), but quite different from the pattern reported for the House Finch, another desert-inhabiting passerine of southern California (Collins and Bender 1977a). *Amphispiza*, like *Spizella*, *Zonotrichia*, and *Poocetes* (Wetherbee 1957), lacks the distinctive rows of lateral pelvic region neossoptiles noted in both *C. mexicanus* and *Paroaria* (Collins and Bender 1977b), the latter a genus of uncertain affinities currently placed in the Emberizinae (Paynter and Storer 1970:212). Unfortunately we know of no similar quantified data for the two nearest related genera, *Chondestes* or *Aimophila*. Neossoptile distribution patterns have proven to be of a limited taxonomic usefulness in other passerines (Wetherbee 1957:351, Collins and Kemp 1976). Thus, the pattern of distribution of neossoptiles, particularly that of the pelvic region, deserves further attention in this array of higher passerines.

LITERATURE CITED

- CLARK, G. A., JR. 1967. Individual variation in natal pterylosis of Red-winged Blackbirds. *Condor* 69:423–424.
- COLLINS, C. T., AND K. E. BENDER. 1977a. The natal pterylosis of the House Finch. *Bull. South. Calif. Acad. Sci.* 76:209–211.
- COLLINS, C. T., AND K. E. BENDER. 1977b. Cervical neossoptiles in a neotropical passerine. *Bull. Br. Ornithol. Club* 97:133–135.
- COLLINS, C. T., AND M. H. KEMP. 1976. Natal pterylosis of *Sporophila* finches. *Wilson Bull.* 88:154–157.
- LINSDALE, J. M. 1936. Coloration of downy young birds and of nest lining. *Condor* 38:111–117.
- PAYNTER, R. A., JR., AND R. W. STORER. 1970. Checklist of birds of the world. Vol. 14. Museum of Comparative Zoology, Cambridge, MA.
- WETHERBEE, D. K. 1957. Natal plumages and downy pteryloses of passerine birds of North America. *Bull. Am. Mus. Nat. Hist.* 113:339–436.
- WETHERBEE, D. K. 1958. New descriptions of natal pterylosis of various bird species. *Bird-Banding* 29:232–236.

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DISTRIBUTION AND MIGRATION OF THE BLACK TERN IN MEXICO

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The Black Tern (*Chlidonias niger*) is rarely mentioned, except in a general way, in literature concerning Mexican birds; consequently, there is little specific information concerning the distribution of the species in Mexico. The "Mexican Check-list" (Friedmann et al. 1950) indicates that the species is largely absent from the interior highlands and that it is unknown from several Pacific coastal states as well. Prior to my field work, I know of but four reports of Black Terns from the interior highlands, and only two of these were from the present century. White (*in* Sclater 1864) reportedly took a specimen near Mexico City (but

the locality is subject to question and the specimen may have come from the lowlands of Veracruz), and Ferrari-Perez (1886) obtained specimens in October in the highlands of Puebla at Laguna de San Baltazar and Laguna de Chapulco. Coffee (1960) saw five at Laguna de Alchichica, Puebla, on 2 June 1951, and Lea and Edwards (1950) reported several in nonbreeding plumage at Lago de Pátzcuaro, Michoacán, on 28 July 1946. During my studies of waterbirds in Mexico, initiated in 1973, I recorded Black Terns on various occasions in the interior highlands as well as along the Pacific coast. My observations are supplemented herein with others provided me by Robert W. Dickerman and Allan R. Phillips, and with previously unreported specimens in the Louisiana State University Museum of Zoology (LSUMZ), provided by J. V. Remsen. These observations and specimens constitute the first published reports of Black Terns for the states of Chihuahua, Durango, Zacatecas, San Luis Potosi, Jalisco, and, apparently, mainland Nayarit, and help to summarize the status of this species in Mexico.

Chihuahua. I found Black Terns to be fairly common at two presas (reservoirs) immediately east of Nuevo Casas Grandes (1,500 m) on 12 August 1976. Most of these were in pied (molting, nonbreeding) or pale (juvinal?) plumage, but a few were in typical black breeding plumage.

Durango. I counted six Black Terns at a marshy, seasonal presa in north-central Durango near Las Cieneguillas (1,830 m, ca. 20 km SE La Zarca) on 29 July 1976, and noted approximately 40 individuals, all in pied plumage, feeding at Presa San Bartolo (1,940 m, ca. 10 km E Canatlán) on 13 August 1975.

Zacatecas. I found Black Terns to be fairly common at a small, shallow, seasonal presa in central Zacatecas near San José de Alamito (2,250 m, ca. 20 km SW Fresnillo) on 14 August 1975.

San Luis Potosí. Three specimens were collected 8–10 August 1950 in the state's far western highlands at "Lag. Hernandez" [=Laguna de Hernández] (2,340 m, ca. 60 km NW Salinas) (LSUMZ). There are also specimens from the state's eastern lowlands at Laguna Cerro del Pez, near Ebano: two fall specimens (23 August 1951 and 3 October 1950) and a single spring specimen on the notably early date of 11 March 1952 (LSUMZ). If accurate, the March date is the earliest for Mexico by over two and one-half weeks; however, I am informed by J. V. Remsen that the native collector was sometimes unreliable on his dates, and that unusual dates should be questioned.

Jalisco. I saw two Black Terns over a small presa immediately east of Laguna de Cajititlán (1,500 m, ca. 30 km SSE Guadalajara) on 23 August 1974, and by 30 August 1974 the species had become fairly common there. R. W. Dickerman (pers. comm.) recorded three Black Terns at Presa de la Vega (1,440 m, ca. 50 km WSW Guadalajara) on 24 September 1962, and saw two at Laguna de Cajititlán on the following day. The latter locality provided my only spring record for the interior highlands, a single individual in pied plumage that I observed on 2 June 1975. Along Jalisco's Pacific coast, however, the species apparently is rather abundant in the spring, at least in some years. On 27 May 1977, I estimated that there were at least 150 individuals along the beach at Barra de Navidad; only 10% of these were in breeding plumage. During the period 12–25 May 1954, A. R. Phillips and D. W. Warner (Phillips, pers. comm.) noted that the species quickly increased from about 100 birds to "thousands" at Puerto Vallarta and over the adjacent waters of the Bahía de Banderas.

Nayarit. I recorded presumed spring migrants along Matanchén beach at San Blas on 11 May 1973; at the same locality R. W. Dickerman (pers. comm.) saw two on 22 September 1962 and three on the following day. These are apparently the first published records for mainland Nayarit, although Streets (1877) obtained two specimens in May at "Mita Point, Sinaloa," which most likely refers to Punta Mita, Nayarit; and Grant (1964) noted the species (on unspecified dates) over the ocean near the Tres Marietas Islands, only 6 km SW Punta Mita.

North of Jalisco and southern Nayarit, the Black Tern is apparently rather scarce in spring on the west coast of mainland Mexico, as I know of but one record for Sinaloa, a sighting of one or two birds at Guasave on 9 April 1959 by A. R. Phillips, W. X. Foerster, and A. J. Foerster (Phillips, pers. comm.), and likewise only one record (28 April 1972) for Sonora (Russell and Lamm 1978). This scarcity is puzzling, given my observations and those of Jehl (1974), who found Black Terns, most of which were in nonbreeding plumage, to be "fairly common to occasionally abundant" in "near-shore" waters from the Tres Marietas Islands (ca. 100 km W mainland Nayarit) southward to the vicinity of Acapulco, Guerrero, during the period 30 March–11 April 1973. The general lack of spring records north of Nayarit may merely reflect an absence of observers, but it could also be due to other causes, such as a more rapid

passage northward, a preference for offshore waters, or even an avoidance of the Gulf of California. Grinnell (1928) provided no spring records for either coast of Baja California, although he considered the species common along the Pacific coast of the peninsula in the fall. Black Terns are numerous in the Gulf of California after mid-July, with flocks of up to 2,000 individuals recorded in early August in coastal Sonora (Gallucci 1981), and Alden (1969) listed the species as "abundant (autumn)" at Mazatlán, Sinaloa.

I am aware of no reports of Black Terns in Mexico between 2 June and 1 July. However, it would not be surprising for some nonbreeding individuals to summer in Mexico, given their occurrence at that season in southern California, Arizona, New Mexico, and from Texas eastward along the northern shores of the Gulf of Mexico. South of Mexico, nonbreeding Black Terns summer commonly in Panama (Eisenmann 1951, 1957, Wetmore 1965), and a few have been noted in Costa Rica in late June (Stiles and Smith 1977) and mid-July (Orians and Paulson 1969); none have been noted in spring or early summer after 26 May in Nicaragua (Howell 1964), 31 May in Honduras (Sibley et al. 1980), and 26 May in Belize (Russell 1964). The earliest dates for presumed southbound migrants in Mexico are 1 July for the east coast (Loetscher 1955), 13 July for the west coast (Russell and Lamm 1978), and 28 July for the interior highlands (Lea and Edwards 1950). Many Black Terns noted south of the known breeding range in late spring and early summer are in nonbreeding plumage, as are the majority of the earliest of the presumed fall migrants.

Black Terns appear to be absent from Mexico during the winter months, for there seem to be no records for the country between 5 November (Inst. Historia Natural Chiapas) and 30 March. The statement by Grayson (*in* Lawrence 1874), repeated in various books, that the species "remains all the winter months" in the vicinity of Mazatlán, has not been confirmed by recent field observations along Mexico's western coast.

Present information, then, confirms that the Black Tern is strictly a migrant in Mexico. Spring migration is relatively compressed (30 March–2 June), with most observations and greatest numbers occurring in April and May on the west coast and in May on the east coast. This northward passage is almost entirely coastal or offshore. Fall migration is comparatively more extended (1 July–5 November), with many observations and sizable numbers reported from early July (e.g., about 150 mostly "immature" birds noted by A. R. Phillips on 5 July 1968 near Veracruz) until well into October. Birds pass southward through the interior highlands of northern and central Mexico as well as along both coasts.

Black Terns are scarce in Mexico east of the Isthmus of Tehuantepec, where they are known (apparently only as fall migrants) only from the northern coast of the state of Yucatán and its offshore reefs (Paynter 1955, Boswall 1978), and from the coast of Chiapas, where they are considered "not very common" (Alvarez del Toro 1971). There seem to be no records from Tabasco and Campeche; however, there are southern Veracruz records from Coatzacoalcos in May (Coffee 1960) and Laguna de Catemaco in May (Andrle 1966), eastern Oaxaca records from San Mateo in August (Lawrence 1875), Laguna Superior near Juchitán in May (LSUMZ), Tehuantepec in May (Univ. Michigan Mus. Zool.), and northeast of Tehuantepec in May (Coffee 1960), and a western Chiapas record from Barra de Paredón near Tonalá in November (Inst. Historia Natural Chiapas). These localities are clustered on the northern and southern sides of the Isthmus, suggesting that some Black Terns regularly cross this narrow neck of land, especially in the spring.

R. W. Dickerman, J. P. Hubbard, and A. R. Phillips kindly read and commented on an earlier draft, and Drs. Dickerman and Phillips allowed me to include their tern

observations. Reviewer S. M. Russell commented on a later draft, as did M. Alvarez del Toro, who called my attention to the Chiapas specimen. J. V. Remsen provided many useful data on specimens under his care at the Louisiana State University Museum of Zoology, as did R. W. Storer on specimens at the University of Michigan Museum of Zoology. Much of my field work in Mexico was supported by the Welder Wildlife Foundation, with additional support from the National Audubon Society and the U. S. Fish and Wildlife Service. I thank K. F. Lueder of Chapala, Jalisco, for his hospitality during the course of much of my field work.

LITERATURE CITED

- ALDEN, P. 1969. Finding the birds in western Mexico. Univ. of Arizona Press, Tucson.
- ALVAREZ DEL TORO, M. 1971. Las aves de Chiapas. Instituto de Ciencias y Artes de Chiapas, Tuxtla Gutiérrez, Mexico.
- ANDRLE, R. F. 1966. North American migrants in the Sierra de Tuxtla of southern Veracruz, México. Condor 68:177-184.
- BOSWALL, J. 1978. The birds of Alacran Reef, Gulf of Mexico. Bull. Br. Ornithol. Club 98:99-109.
- COFFEE, B. B., JR. 1960. Late North American spring migrants in Mexico. Auk 77:288-297.
- EISENMANN, E. 1951. Northern birds summering in Panama. Wilson Bull. 63:181-185.
- EISENMANN, E. 1957. Notes on the birds of the province of Bocas del Toro, Panama. Condor 59:247-262.
- FERRARI-PEREZ, F. 1886. Catalogue of animals collected by the Geographical and Exploring Commission of the Republic of Mexico. Proc. U.S. Natl. Mus. 9:125-199.
- FRIEDMANN, H., L. GRISCOM, AND R. T. MOORE. 1950. Distributional check-list of the birds of Mexico, Pt. 1. Pacific Coast Avifauna 29:1-202.
- GALLUCCI, T. 1981. Summer bird records from Sonora, Mexico. Am. Birds 35:243-247.
- GRANT, P. R. 1964. The birds of the Tres Marietas Islands, Nayarit, Mexico. Auk 81:514-519.
- GRINNELL, J. 1928. A distributional summation of the ornithology of Lower California. Univ. Calif. Publ. Zool. 32 (1):1-300.
- HOWELL, T. R. 1964. Birds collected in Nicaragua by Bernardo Ponsol. Condor 66:151-158.
- JEHL, J. R., JR. 1974. The near-shore avifauna of the Middle American west coast. Auk 91:681-699.
- LAWRENCE, G. N. 1874. The birds of western and north-western Mexico, based upon collections made by Col. A. J. Grayson, Capt. J. Xantus, and Ferd. Bischoff, now in the museum of the Smithsonian Institution, at Washington, D.C. Mem. Boston Soc. Nat. Hist. 2: 265-319.
- LAWRENCE, G. N. 1875. Birds of southwestern Mexico collected by Francis E. Sumichrast for the United States National Museum. Bull. U.S. Natl. Mus. 4:1-52.
- LEA, R. B., AND E. P. EDWARDS. 1950. Notes on birds of the Lake Patzcuaro region, Michoacan, Mexico. Condor 52:260-271.
- LOETSCHER, F. W., JR. 1955. North American migrants in the state of Veracruz, Mexico: a summary. Auk 72: 14-54.
- ORIAN, G. H., AND D. R. PAULSON. 1969. Notes on Costa Rican birds. Condor 71:426-431.
- PAYNTER, R. A., JR. 1955. The ornithogeography of the Yucatán Peninsula. Peabody Mus. Nat. Hist. Yale Univ. Bull. 9:1-347.
- RUSSELL, S. M. 1964. A distributional study of the birds of British Honduras. Ornithol. Monogr. 1:1-195.
- RUSSELL, S. M., AND D. W. LAMM. 1978. Notes on the distribution of birds in Sonora, Mexico. Wilson Bull. 90:123-131.
- SCLATER, P. L. 1864. List of a collection of birds procured by Mr. George H. White in the vicinity of the City of Mexico. Proc. Zool. Soc. Lond. (1864):172-179.
- SIBLEY, F. C., G. F. BARROWCLOUGH, AND C. G. SIBLEY. 1980. Notes on the birds of Honduras. Wilson Bull. 92:125-126.
- STILES, F. G., AND S. M. SMITH. 1977. New information on Costa Rican waterbirds. Condor 79:91-97.
- STREETS, T. H. 1877. Contributions to the natural history of the Hawaiian and Fanning Islands and Lower California. Bull. U.S. Natl. Mus. 7:1-172.
- WETMORE, A. 1965. Birds of the Republic of Panamá, Pt. 1. Smithsonian Misc. Collect. 150:1-483.

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EFFECT OF MATE LOSS ON SONG PERFORMANCE IN THE PLAIN TITMOUSE

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Past studies on titmice have found song to serve exclusively in defense of territory (e.g., Dixon 1949, Lemon 1968, Krebs et al. 1978), yet Krebs et al. (1981) showed that in the Great Tit (*Parus major*) song may also function to attract females. They noted that after a female was removed from a mated pair, the male increased song output almost six-fold and, when reunited with the female, subsequently decreased his singing.

While studying the singing behavior of the Plain Tit-

mouse (*Parus inornatus*), I observed a similar but natural experiment when two males lost their mates. In this note I describe the changes in singing behavior of these males and discuss their significance concerning the roles of song in parids.

The study population was located 22 km N of Flagstaff, Arizona in a pinyon-juniper-ponderosa pine ecotone. In 1982, five males and some females were marked with U.S. Fish and Wildlife Service aluminum bands and unique combinations of colored plastic leg-bands. Birds were observed between 06:00 and 12:00 usually for a period of one hour per day several times a week. Observations were made from early March through late May. Songs, behavioral observations, and timing (from running stopwatches) were recorded simultaneously on a Uher 4000 Report IC tape recorder with a Dan Gibson parabolic microphone.

This report deals with the behavior of four territorial males, all of whom were mated at the beginning of the