

NOTES ON *LASIURUS EGA*

The southern yellow bat, *Lasiurus ega* (Gervais), has a wide geographic and ecologic distribution, but few specimens have been available for study and their taxonomic allocations have differed in the literature. Handley (1960), for example, examined only 48 specimens from North and South America, and Hall and Jones (1961), in their review of North American samples, studied 22 specimens. Handley assigned specimens from Central America and Mexico, as far north as central Veracruz, to *Lasiurus ega panamensis* (Thomas). Hall and Jones, and subsequently Villa (1966), however, suggested that all specimens north of Panama represented *Lasiurus ega xanthinus* (Thomas). Baker and Patton (1967) studied chromosomes of five specimens from Mexico and found geographic variation in morphology of sex chromosomes and color of pelage. Specimens from Chiapas had an acrocentric X chromosome and dark pelage and were assigned to *L. e. panamensis*. In contrast, examples of *L. e. xanthinus* from Sonora had submetacentric X chromosomes and paler pelage. Goodwin (1969) assigned some specimens from Oaxaca to *L. e. panamensis* and noted that *L. e. xanthinus* might also occur in the state.

During the past four years, members of the Department of Biology at Texas Tech University (TT) have collected more than 100 specimens of *L. ega* from several localities in Texas and Mexico. Ninety-seven specimens from a natural palm grove 5 mi. SE Brownsville, Texas, represent the first records of the species for that state and extend the known geographic range 150 miles northward from near Piedra, southern Tamaulipas (Alvarez, 1963). The series is also the first large sample available from one locality. All individuals were taken in mist nets that were stretched beneath the canopy of palm trees, *Sabal texana*. The southern yellow bat probably is a permanent resident of the grove because individuals have been taken in 6 different months of the year, including December.

Dates of collection and number of each sex of *L. ega* and other species of bats obtained near Brownsville are summarized in Table 1. Data from these collections are the basis for the following comments on biology of *L. ega*.

**Reproduction.**—Pregnant females were collected twice—all six taken on 24 April and one of the 11 obtained on 8 June. One of the six females obtained in April had two embryos; the average crown-rump length (with embryonic membranes removed) was 3 millimeters. Each of the other five females had three embryos; their average crown-rump lengths varied from 11 to 14 millimeters. The female collected in June had four embryos; their average length was 25 millimeters. Nine of the 10 other females taken on 8 June were lactating.

**Sexual and nongeographic variation.**—We studied 69 bats that were captured at the same locality (Brownsville, Texas) on 11 September 1968. The sample included young of the year and adults which we used to estimate age and sexual variation in certain osteological characters (Table 2). The standard aging techniques of wear of teeth, development of sagittal crest, epiphyseal closing of phalanges, and bimodality in distribution of lengths of forearm yielded less repeatable results than did the state of the pubic symphysis. Among females, we could recognize three conditions of the pubic symphysis: 1) pubes separated by at least 1 to 2 millimeters, the gap completely bridged by an interpubic ligament; 2) pubes incompletely joined along an irregular and often indistinct line, but sometimes with a partial gap spanned by ligament; and 3) pubes meeting along a distinct, straight line. The first condition is consistent with Crelin's (1969) findings for breeding adults, and the 12 females in our sample with an open symphysis had probably borne young the preceding spring. The breeding status of females with the second condition is uncertain and cannot be resolved until animals of known age are studied. Five of the 18 specimens in this class had significant ligamentous portions to otherwise closed symphyses, which suggests a continuum between the first two conditions. Thus, we judge both conditions to represent adults. By comparison, conditions two and three are distinct from each other. That the latter is characteristic of the young-of-the-year is supported by the neat suture at the symphysis, the general fragility of the innominates, and by comparison of means of measurements of animals here determined as adult or immature (Table 2).

TABLE 1.—*Bats collected in Texas (5 mi. SE Brownsville) in the period 1968 to 1971.*

Date	<i>Lasiurus ega</i>		<i>Lasiurus intermedius</i>		<i>Nycticeius humeralis</i>		<i>Antrozous pallidus</i>
	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♀
27 June 1968	0	1	0	0	2	1	0
30 July 1968	3	1	0	0	0	1	0
6 Aug. 1968	0	4	0	0	0	1	0
11 Sept. 1968	20	49	2	2	72	156	1
23 Dec. 1968	0	0	0	0	0	0	0
19 June 1969	1	0	0	0	26 (not sexed)		0
6 Sept. 1969	5	3	0	0	16	41	0
7 Sept. 1969	0	0	0	0	3	17	0
27 Dec. 1969	1	2	0	0	1	2	0
8 June 1970	2	11	0	0	4	4	0
24 April 1971	1	6	0	0	1	2	0

All males of the sample taken in September appeared to be immatures. Qualitatively, the pubes of males are heavier and conspicuously more ossified than those of females. The symphysis in males is most like condition number two described above for females. Ossification, however, frequently obscures part of the symphysis. The pubic arches of adult males are completely ossified, with no apparent vestige of a former separation. Furthermore, the testes of males collected on 11 September were not enlarged at a time when adult *Lasiurus* are presumed to breed (Asdell, 1964).

Age variation in selected external and cranial measurements was studied only in females (Table 2). Immatures averaged smaller, but never significantly so (at the .05 per cent level), in all measurements taken except maxillary breadth. Means of the two age classes were not significantly different in that dimension.

Because there were no adult males in the sample, we studied sexual variation between immatures. Immature females averaged significantly ( $P = .05$ ) larger than the immature males in all measurements taken except interorbital breadth (Table 2). Males have wider interorbital breadths, but the difference is not significant.

**Geographic variation.**—We have compared our new material with specimens in the Museum of Natural History, University of Kansas (KU); the Department of Wildlife Science, Texas A & M University (TAM); and the Department of Biology, University of Arizona (UA). Specimens from Texas differ from examples of *L. e. xanthinus* from northern Mexico and Arizona in two characters—conspicuously darker pelage and an acrocentric X chromosome (Fig. 1). In these features they more closely resemble specimens from southern Mexico, specimens that have been assigned to *L. e. panamensis* by some workers. Alvarez (1963) found animals with dark pelage and some with pale pelage within his sample from Tamaulipas, but we found this contrast less striking than that between skins from Texas and Arizona.

Although we have examined 162 specimens of *L. ega* from Texas and Mexico, we cannot detect precise subspecific boundaries because of nongeographic and secondary variation, and small sample sizes. Based upon karyotypes and color of pelage, however, the specimens from Brownsville resemble those from eastern coastal and southern Mexico more than representatives from the Sonoran Desert and Mexican Plateau. Therefore, we refer the specimens from Brownsville to *L. e. panamensis*.

TABLE 2.—Measurements of 69 *L. ega* captured 5 mi. SE Brownsville, Texas, on 11 September 1969. Abbreviations: *N*, sample size; *SD*, one standard deviation; *SE*, one standard error; *CV*, coefficient of variation; *J*, juvenile; *A*, adult.

	Mean	<i>N</i>	<i>SD</i>	<i>SE</i>	Minimum	Maximum	<i>CV</i>	Sex and age
Total length	117.53	30	4.07	0.755	110.0	124.0	3.45	A ♀
	115.95	19	5.28	1.243	104.0	123.0	4.55	J ♀
	110.25	20	3.75	0.861	104.0	120.0	3.40	J ♂
Tail length	51.53	30	3.28	0.609	45.0	58.0	6.36	A ♀
	50.80	19	3.28	0.721	45.0	58.0	6.45	J ♀
	47.20	20	2.74	0.630	41.0	52.0	5.82	J ♂
Forearm	46.98	30	0.96	0.179	44.2	48.5	2.05	A ♀
	46.12	19	1.43	0.338	44.1	49.0	3.10	J ♀
	44.84	20	1.10	0.253	43.0	47.3	2.46	J ♂
Greatest length of skull	15.62	30	0.27	0.051	15.0	16.2	1.76	A ♀
	15.47	19	0.26	0.061	15.0	16.0	1.68	J ♀
	15.15	20	0.35	0.081	14.6	15.8	2.32	J ♂
Length of maxillary tooththrow	5.38	30	0.12	0.025	5.1	5.6	2.46	A ♀
	5.31	19	0.15	0.035	5.1	5.6	2.80	J ♀
	5.08	20	0.13	0.027	4.9	5.3	2.36	J ♂
Maxillary breadth	7.29	30	0.19	0.035	7.0	7.6	2.59	A ♀
	7.30	19	0.15	0.036	7.0	7.6	2.09	J ♀
	6.91	20	0.15	0.034	6.6	7.2	2.15	J ♂
Interorbital breadth	4.64	30	0.17	0.031	4.3	5.0	3.56	A ♀
	4.58	19	0.13	0.030	4.3	4.8	2.78	J ♀
	4.65	20	0.19	0.044	4.4	5.1	4.09	J ♂

**Specimens examined.**—Total 162, alphabetically by state as follows: ARIZONA.—*Cochise Co.*: Floyd's Hole, 18 mi. E Douglas, 4000 ft (1 TT; 1 UA); Chiracahua Mtns., Herb Martyr Dam (1 UA). *Maricopa Co.*: Phoenix (6 UA). *Pima Co.*: 2.4 mi. E Saseby (1 UA); Tucson, UA Campus (2 UA). *Pinal Co.*: Casa Grande (1 TT). *Yuma Co.*: Yuma (1 UA). BAJA CALIFORNIA DEL SUR.—Miraflores (11 KU). CHIAPAS.—Rancho San Fernando, 42 km W Cintalapa (2 UA); Puente Bado Ancho, carretera Arriaga a Tapachula (1 UA); Finca Ocuilapa, 8 mi. SE Tonala (1 UA); 18 mi. S La Trinitaria (1 TAM). COAHUILA.—4 mi. W Hda. La Mariposa, 2300 ft (2 KU). GUERRERO.—El Papayo, 25 ft (1 TAM). JALISCO.—5 mi. S Grullo (1 KU); El Tabaco, 200 ft (1 KU); Toliman, 2200 ft (1 KU). NAYARIT.—2 mi. W Tecuala (1 TT). NUEVO LEON.—7 mi. NW Providencia, 6800 ft (1 KU); Ojo de Agua, 2½ mi. SW Sabinas Hidalgo, 1500 ft (5 TAM). SINALOA.—Mazatlán (1 KU); 1 mi. S Pericos (1 KU); ½ mi. SE Vaca, 650 ft (1 KU). SONORA.—Rio Alamos, 8 mi. S Alamos (1 UA); Rio Cuchijaqui, 11.3 mi. SSE Alamos (1 UA); Boca Chimpampa Bay, 8 mi. NW Guaymas (1 UA); N side Boca Chimpampa Bay, 13 mi. NW Guaymas (1 UA); San Carlos Bay, 10 mi. NW Guaymas (1 UA); 2.6 mi. E, .4 mi. S Tecoripa (3 TT). TAMAULIPAS.—Sierra de Tamaulipas, 10 mi. W, 2 mi. S Piedra, 1200 ft (4 KU), and 10 mi. W, 3 mi. S Piedra, 1200 ft (1 KU), and 16 mi. W, 3 mi. S Piedra, 1400 ft (1 KU); 68 km S Ciudad

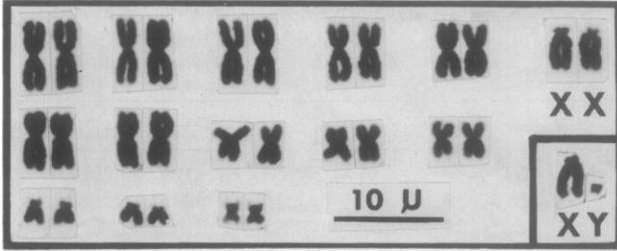


FIG. 1.—Karyotype of a female *Lasiurus ega* from 5 mi. SE Brownsville, Texas; inserted are sex chromosomes of a male from the same locality.

Victoria (2 TT). TEXAS.—Cameron Co.: 5 mi. SE Brownsville (97 TT). VERACRUZ.—Ojo de Agua del Rio Atoyac, 18° 56' N, 96° 54' W (1 TT). ZACATECAS.—Conception de Oro, 7680 ft (4 KU).

**Specimens karyotyped** (total 22).—With acrocentric X chromosome: TEXAS: Cameron Co., 5 mi. SE Brownsville (7 males, 10 females); TAMAULIPAS, 68 km S Cd. Victoria (1 male); VERACRUZ: Ojo de Agua del Rio Atoyac, 18° 56' N, 96° 54' W (1 female). With submetacentric X chromosome: Sonora: 2.6 mi. E, .4 mi. S Tecoripa (3 females).

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