

A COLLECTION OF THE BAT *Lonchophylla robusta* MILLER
FROM COSTA RICA

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Bats of the genus *Lonchophylla* Thomas, 1903 are known only from Recent specimens (Simpson, 1945). They have been reported from the Central and South American parts of the Brazilian Subregion of the Neotropical Region (Hershkovitz, 1958), from Bahía in Brazil to Costa Rica (Bourliere, 1955). Cabrera (1957) and Hall and Kelson (1959) recognized five species in this genus (type localities in parentheses): *Lonchophylla mordax* Thomas 1903 (Lamarão, State of Bahía, Brazil); *L. hesperia* G. M. Allen 1908 (Zorritos, Perú); *L. thomasi* J. A. Allen 1904 (Ciudad Bolívar, Venezuela); *L. robusta* Miller 1912 (cave on Río Chilibrillo, Panamá); and *L. concava* Goldman 1914 (Cana, 2000 ft. eastern Panamá). *Lonchophylla robusta* is restricted to Colombia and Panamá (Cabrera, 1957). *Lonchophylla concava* is known only from its type locality (Hall and Kelson, 1959). Goodwin (1946) included both species in his list of Costarrican mammals although none of the specimens he listed was from Costa Rica. Hall and Kelson (1959) did not include all of Panamá in the range map of *L. robusta* but showed the range ending slightly north of the Canal Zone. No specimens of *Lonchophylla* have been recorded from Costa Rica.

Tulane University field crews and Dr. John L. DeAbate (University of Costa Rica) collected the first known specimens of the genus *Lonchophylla* from Costa Rica in 1956 and 1957. These collections represent an extension of the known geographic distribution of the genus and a new record for Costa Rica.

Materials and Methods.—Comparison of the specimens from Costa Rica to those from Panamá revealed considerable size variation in this little known species. Sixteen measurements were taken of each specimen (Table 1). Range, arithmetic mean, standard deviation, and standard error of the mean for each measurement was calculated. All measurements made follow those of Cockrum (1955) or are those given in the

original description of *Lonchophylla robusta* (Miller, 1912). Statistical methods employed, including comparison of the means by Student's *t* test, follow Simpson *et al* (1960). All measurements are expressed in millimeters.

The two samples dealt with in this study include 27 specimens from Panamá and ten from Costa Rica. Each sample included adults of both sexes. Complete epiphyseal closure in the humerus indicates that all animals used were adults. The Costarrican sample contained four males and six females collected from an unnamed cave approximately four kilometers southwest of Hacienda de Moravia, State of Cartago, Costa Rica. The sample from Panamá contained nine females and 18 males. Specimens of *L. robusta* examined, the specimen number and institution are: Tulane University, TU 605, 606, 607, 608, 609, 610, 611, 612, 613, 614; University of Kansas, KU 45074*, 45075*; University of California, UC 114388*, 114390*, 114389*, 114391*; Museum of Comparative Zoology, MCZ 26467, 26468, 33444, 33445, 33446, 33447, 33448, 33449, 33450, 33451, 33452, 33453, 33454, 33455, 33456, 33457, 33458, 33459, 33460, 34243*, 34244*. All Panamanian specimens of *L. robusta* are topotypes except two (MCZ 34243 and MCZ 34244), collected at Río Pequeni, Salamanca Hydrographic Office, Canal Zone.

Other specimens examined are: 1 *Lonchophylla mordax*, MCZ 33216*, Cidada da Barra, Río San Francisco, Bahía, Brazil; and 1 *Lonchophylla thomasi*, AMNH 97272*, Mocajuba, Río Tocantins, Brazil. Those specimens prepared as study skins are indicated by an asterisk.

COMPARISON

External characters.—Three external characters (height of the ear from notch, total length, and length of the hindfoot) differ significantly at the 5 percent level (fig. 1). In each instance, the Costarrican animals are smaller than those of the Panamanian sample.

TABLE 1.

Ranges of measurements, means, standard deviation, standard error, and levels of significance on all measurements made. Figures in parentheses indicate number of specimens.

	Panamanian Specimens					Level of Significance	Costarrican Specimens			
	Range of Measurements	Mean	SD	SE			Range of Measurements	Mean	SD	SE
Total Length	(8) 76.0-82.0	79.4	2.2	0.77	0.1%		(8) 66.0-75.0	70.6	2.9	1.0
Tail Length	(8) 8.0-10.0	9.3	0.88	0.31	not sig.		(10) 7.7-10.0	8.7	0.73	0.23
Hindfoot Length	(27) 11.0-15.0	12.0	1.0	0.20	1%		(10) 9.0-11.0	10.3	0.81	0.25
Height of Ear	(27) 14.0-18.0	15.7	0.90	0.17	0.1%		(9) 13.0-15.0	13.7	0.66	0.07
Length of Forearm	(25) 39.7-44.0	41.9	1.1	0.22	not sig.		(10) 41.6-45.0	42.7	1.0	0.34
Length of Tibia	(27) 15.3-18.4	17.3	0.82	0.16	not sig.		(10) 15.4-20.7	18.0	1.6	0.50
Length of Thumb	(27) 11.0-13.3	12.0	0.49	0.09	not sig.		(10) 11.5-13.2	12.0	0.55	0.17
Skull Length	(9) 25.0-26.7	26.1	0.50	0.17	5%		(10) 24.7-26.3	25.6	0.52	0.16
Skull Width	(9) 10.5-11.4	10.9	0.28	0.03	0.1%		(9) 10.0-10.5	10.3	0.21	0.07
Interorbital Width	(10) 4.9- 5.3	5.0	0.18	0.06	5%		(10) 4.6- 5.0	4.9	0.13	0.04
Width of Rostrum Over Canines	(11) 4.0- 4.4	4.1	0.12	0.04	1%		(9) 3.5- 4.1	3.8	0.25	0.08
Depth of Brain Case	(10) 7.1- 7.7	7.5	0.20	0.06	not sig.		(10) 7.2- 7.6	7.4	0.17	0.05
Length of Maxillary Tooth Row	(11) 9.3-10.1	9.8	0.25	0.08	not sig.		(10) 9.1-10.0	9.6	0.26	0.08
Mandible Length	(10) 17.4-19.1	18.5	0.55	0.17	not sig.		(10) 18.0-19.1	18.5	0.39	0.12
Length of Mandibular Tooth Row	(10) 9.8-10.5	10.2	0.23	0.07	not sig.		(10) 9.5-10.3	10.0	0.32	0.10
Condylal Length	(9) 22.9-24.7	24.0	0.62	0.21	not sig.		(9) 23.0-24.0	23.5	0.30	0.10

Cranial characters.—Four of the cranial measurements (length of the skull, width of the skull across the brain case, inter-orbital width, and width of the rostrum over the canines) differ at the 5 percent level (fig. 2). The Costarrican specimens have a shorter skull, are narrower across the brain case, at the inter-orbital constriction, and above the canines. The two measurements made on the mandible showed no significant difference.

Sexual differences.—No sexual dimorphism in color or size was noted.

DISCUSSION

Although the means of skull length of the two samples differed significantly, this accounts for a very small part of the difference exhibited in total length. Tail length did not differ significantly. The Costarrican animals differ from those from Panamá mainly in the length of the region between the base of the skull and the first caudal vertebra. Ear height of the Costarrican sample seems to distinguish this group from the longer eared Panamanian specimens. Since the hind foot measurements of the Pana-

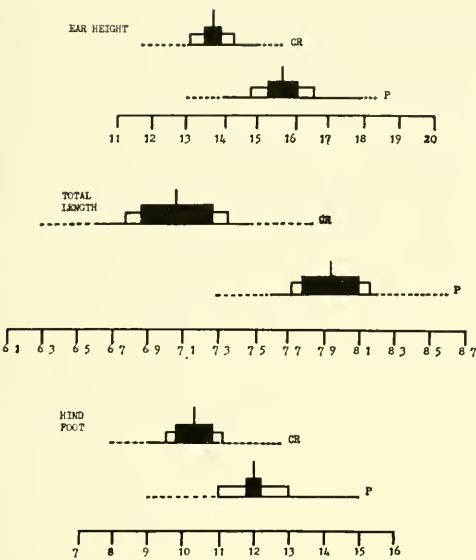


Figure 1. Distribution frequency of external measurements that differ significantly. The solid horizontal line represents range and the dotted extensions represent computed range. The vertical bar represents the mean, the hollow rectangle ± 1 standard deviation, and the solid rectangle twice the standard error on either side of the mean. CR = Costarrican sample, P = Panamanian sample.

manian sample were obtained largely from alcoholic specimens, the degree of difference shown may not be true.

Possibly, the animals from Costa Rica and those from Panamá might be regarded as subspecifically distinct. However, due to lack of material from the intervening area and the small sample from Costa Rica, such a course seems premature.

Table 1 shows all the measurements made on both samples, the ranges, means, standard deviations, and standard errors of the means for each character measured in each sample, and the level of significance of the differences between the means.

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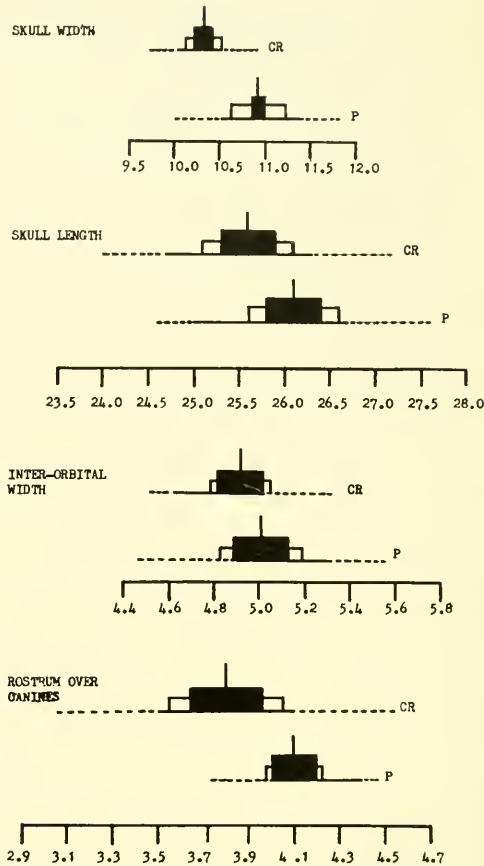


Figure 2. Distribution frequency of skull measurements that differ significantly. Explanation same as Figure 1.

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ABSTRACT

Ten *Lonchophylla robusta* were collected from an unnamed cave approxi-

mately four kilometers southwest of Hacienda de Moravia, State of Cartago, Costa Rica on 12 September 1956 (eight specimens) and 2 July 1957 (two specimens). These represent the first published record of *Lonchophylla* from Costa Rica. The specimens from Costa Rica are smaller than Panamanian representatives, differing significantly in seven of sixteen characters. Possibly the animals from Costa Rica should be regarded as subspecifically distinct, but until more material becomes available from the intervening area formal recognition as a distinct taxon seems premature.