

LONG-LEGGED BAT IN ALBERTA*

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Long-legged bats (*Myotis volans*) are widely distributed in western North America. They range from Alaska to Mexico and as far east as western North and South Dakota and Nebraska.² In Alberta specimens have been taken at Henry House,⁴ Dried Meat Lake,⁸ and along the Milk River.⁶ Schowalter has recently collected specimens at Cadomin and Chungo Caves and additional specimens along the Milk River. The specimens collected by Schowalter have been deposited in the Provincial Museum of Alberta.

Although the species is wide ranging, few details of its life history are available. Barbour and Davis have summarized this information.² Nothing has been reported for the species from Alberta. The specimens obtained along the Milk River were collected by scooping them out of the air with a hand held net as the bats flew by a farm yard light or in a mist net placed across a water hole, and the specimens from Cadomin and Chungo were mist netted at the mouth of the caves (Schowalter, *pers. comm.*). The site along the Milk River is near sandstone cliffs with cottonwoods growing on the flood plain between the cliffs and the river. The water hole site is located near the Milk River valley but on open grassland. Cadomin and Chungo Caves are located in the mountains of southwestern Alberta.

Table I outlines the dates collections were made and the age and sex

of the specimens collected. The age of the specimens was determined by the amount of cartilage apparent at the finger joints.² One other specimen has been collected at Lethbridge on 24 July 1977 but this specimen has not been aged or sexed and is preserved in alcohol.

Myotis volans is a medium sized brown bat. It superficially resembles the more common *Myotis lucifugus* but is easily distinguishable by its short, rounded ears, fur on the underside of the wing that extends from the elbow to the knee, and a keeled calcar.⁵ The skull is small and delicate with a short rostrum,³ and a large, high braincase.⁵ Four subspecies have been described for this bat, two confined to Mexico and two farther north.⁵ One subspecies (*Myotis volans longicus*) is reported for Canada.¹ On 5 September 1911 J.H. Riley collected a bat at Henry House, Alberta that Hollister named *Myotis altifrons*.⁴ Miller and Allen referred this specimen to *Myotis volans longicus*.⁵ Michael Bogan, in a letter to D. Schowalter (14 November 1977), thought that this specimen is closer to *M. v. interior* than to *M. v. longicus*. With additional specimens now at hand it is possible to compare specimens from different regions of Alberta.

A suite of 15 measurements were used in this study: Total length (TL), hind foot (HF), ear (E) and tail were taken from specimen labels and are the preparator's measurements. In addition, the following measurements were taken by the writer: forearm (FA), condylocanine length

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TABLE 1. Specimens of *Myotis volans* collected in Alberta.

	Date Collected	Number Collected		Age	
		Male	Female	Adult	Juv.
Milk River	4 June 1976	1	1	2	—
	13 September 1977	4	—	3	1
	24 June 1977	—	1	1	—
Cadomin	7 September 1977	1	—	1	—
	20 September 1977	1	1	2	—
	17-18 August 1978	16	1	8	9
Chungo	20 September 1978	15	2	10	7

TABLE II. Measurements Adult Males — *Myotis volans* (Measurements in mm)

		Chungo-Cadomin (n=25)	Milk River (n=3)
TL	Range	103-92	93-91
	mean	98.16	92
	SD	2.48	.99
HF	Range	11-9	10-9
	mean	10.0	9.33
	SD	.49	.58
E	Range	15-12	12-11
	mean	14.12	11.67
	SD	.60	.58
FA	Range	38.72-35.27	38.78-35.80
	mean	36.91	37.16
	SD	.79	1.50
CC	Range	13.25-12.59	12.92-12.37
	mean	12.86	12.57
	SD	.17	.31
GS	Range	14.77-13.66	14.08-13.62
	mean	14.06	13.78
	SD	.25	.26
IB	Range	4.17-3.75	4.00-3.83
	mean	3.96	3.91
	SD	.20	.09
BB	Range	7.48-6.85	7.08-6.90
	mean	7.21	7.0
	SD	.18	.09

OD	Range	5.73-5.10	5.43-5.09
	mean	5.31	5.23
	SD	.16	.18
MTR	Range	5.44-5.08	5.24-5.02
	mean	5.25	5.15
	SD	.10	.12
MAXB	Range	5.85-5.39	5.83-5.39
	mean	5.62	5.61
	SD	.23	.22
RL	Range	6.12-5.14	5.61-5.04
	mean	5.60	5.36
	SD	.28	.29
TAIL	Range	44-39	43-41
	mean	41.8	42.33
	SD	1.55	1.15
MAST.B	Range	7.95-7.53	7.92-7.30
	mean	7.77	7.63
	SD	.10	.31
LEG. LENG	Range	19.92-17.56	18.64-18.46
	mean	18.57	18.57
	SD	.61	.10

TABLE III. Adults Females — *Myotis volans* (Measurements in mm)

		Chungo-Cadomin. (n=2)	Milk River (n=2)
TL	Range	99-96	97-95
	mean	97.5	96
	SD	2.12	1.41
HF	Range	10-10	11-8
	mean	10	9.5
	SD	0.0	2.12
E	Range	14-12	16-14
	mean	13	15
	SD	1.41	1.41
FA	Range	38.20-37.18	38.55-38.02
	mean	37.69	38.29
	SD	.72	.38
CC	Range	13.06-12.77	12.80-12.76
	mean	12.92	12.78
	SD	.21	.03
GS	Range	14.38-14.05	13.92-13.66
	mean	14.22	13.79
	SD	.23	.18

IB	Range	4.00-3.83	3.95-3.84
	mean	3.92	3.90
	SD	.12	.08
BB	Range	7.33-7.24	7.04-6.95
	mean	7.29	7.0
	SD	.06	.06
OD	Range	5.67-5.35	5.22-5.22
	mean	5.51	5.22
	SD	.23	0.0
MTR	Range	5.37-5.10	5.22-5.00
	mean	5.24	5.11
	SD	.19	.16
MAXB	Range	5.62-5.62	5.41-5.40
	mean	5.62	5.405
	SD	0.0	.01
RL	Range	5.46-5.03	5.54-5.22
	mean	5.25	5.38
	SD	.30	.23
TAIL	Range	44-42	44-43
	mean	43	43.5
	SD	1.41	.71
MAST.B	Range	7.91-7.78	7.80-7.76
	mean	7.85	7.78
	SD	.09	.03
LEG. LENG	Range	19.44-19.21	18.82-18.48
	mean	19.33	18.65
	SD	.16	.24

TABLE IV. Tooth Anomalies in *Myotis volans*.

Museum No.	Tooth Anomaly	Sex	Age	Location
Z77.62.2	Right lower P ₂ missing Left upper P ² very small	Female	Adult	Cadomin
Z78.83.17	Right upper canine, P ² , and P ³ missing	Male	Adult	Cadomin
Z78.98.16	Upper P ³ missing on both sides	Male	Adult	Chungo
Z78.98.17	Upper P ³ on both sides extremely small	Male	Adult	Chungo
Z78.98.18	Left upper P ² and Right lower P ₃ missing	Female	Adult	Chungo

(CC), greatest skull length (GS), inter-orbital width (IB), breadth of braincase (BB), occipital depth (OD), maxillary tooth row (MTR), maximum breadth across M³ (MaxB), rostral length (RL), mastoid breadth (MAST B), and length of tibia (Leg Leng). Comparisons of means of measurements between bats collected at Cadomin and Chungo Caves were made with those collected along the Milk River. Comparisons were also made between the sexes from both areas. Any conclusions based on size alone are tentative due to the extremely small sample sizes of some classes. (Tables II, III).

When comparing males to males it appears that the specimens from the Cadomin-Chungo area are larger than those from the Milk River. In the 15 characters compared, those specimens from Cadomin-Chungo are larger in 12 characters, specimens from Milk River are larger in two characters, and one character is the same for both areas. Similarly, when females from these areas were compared those specimens from Cadomin-Chungo are larger in 12 characters and those specimens from Milk River are larger in 3 characters.

The size difference between sexes seems to indicate that females are slightly larger than males. In the Cadomin-Chungo area females are larger in eight characters, males larger in five characters, and two characters are the same. In the Milk River area females are larger in ten characters, males are larger in four, and one character is the same for both.

The pelage of both males and females from a given area is similar. Those bats from the Milk River have a lighter pelage color than those bats from the Cadomin-Chungo area. Immature bats have a darker pelage than adults and the immature bats

from the Milk River area have a lighter pelage color than the more northern bats. Similarly, the color of the flight membranes is lighter in the Milk River specimens.

The pelage of the southern bats may be described as yellow-brown on the back and light yellow-grey on the belly. The northern bats are dark smoky brown on the back and smoky grey on the belly.

In view of the slight differences in size (the northern specimens are larger than the southern specimens) and the marked differences in pelage, I believe those bats from the Milk River area are referable to *Myotis volans interior* and those from the Cadomin-Chungo area are referable to *Myotis volans longricus*. Miller and Allen in their key to *Myotis volans* distinguish between these two races on the basis of pelage coloration.⁵ If my conclusion is correct, this is the first record of the subspecies *Myotis volans interior* in Canada.

The range of *Myotis volans* in Alberta is shown to be along the mountains with an area in the central region of the province extending to the Edmonton area. This extension is due to a specimen collected by Soper at Dried Meat Lake. This specimen is on deposit at the University of Alberta. When I examined it I believe that it is misidentified and should be referred to as *Myotis lucifugus*. On this basis then, I suggest that the range for *Myotis volans longricus* be confined to the mountain regions of the province and the range for *Myotis volans interior* is along the Milk River in Alberta similar to that outlined by Hall and Kelson³ and extending as far north as Lethbridge.

In examining the skulls of these specimens a note was made on the number and size of the small pre-molars in both the upper and lower

jaws. The dental formula for *Myotis volans* is: I 2/3, C 1/1, Pm 3/3, M 3/3, for a full complement of 38 teeth. The premolars consist of two small teeth (Premolars 2 and 3) and one large tooth (Premolar 4). In the upper jaw P² and P³ are small and crowded, so much so that occasionally P³ may be hidden when viewed from the side. In the lower jaw there is less crowding and P₂ and P₃ are more in-line with the other teeth.⁵ Table IV lists a number of specimens in which some form of dental anomaly was noted. In only one case (Z78.83.17) is it believed that the missing teeth are the result of a pathological condition. In the other cases it is believed that the crowding of the premolars has resulted in teeth being missing. In a search of the literature available to me I have not been able to find any reference to this having occurred in *Myotis volans*, although it has been reported in *Myotis lucifugus* (see Smith⁷). No explanation can be offered at this time on why this is occurring in this species because of so few examples.

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¹BANFIELD, A.W.F. 1974. The Mammals of Canada. Univ. of Toronto Press, Toronto. 438 pp.

²BARBOUR, R.W. and W.H. DAVIS. 1969. Bats of North America. Univ. Press of Kentucky, Lexington, Kentucky. 286 pp.

³HALL, E.R. and K.R. KELSON. 1959. The Mammals of North America. Ronald Press Co., New York. Vol. 1. 546 pp.

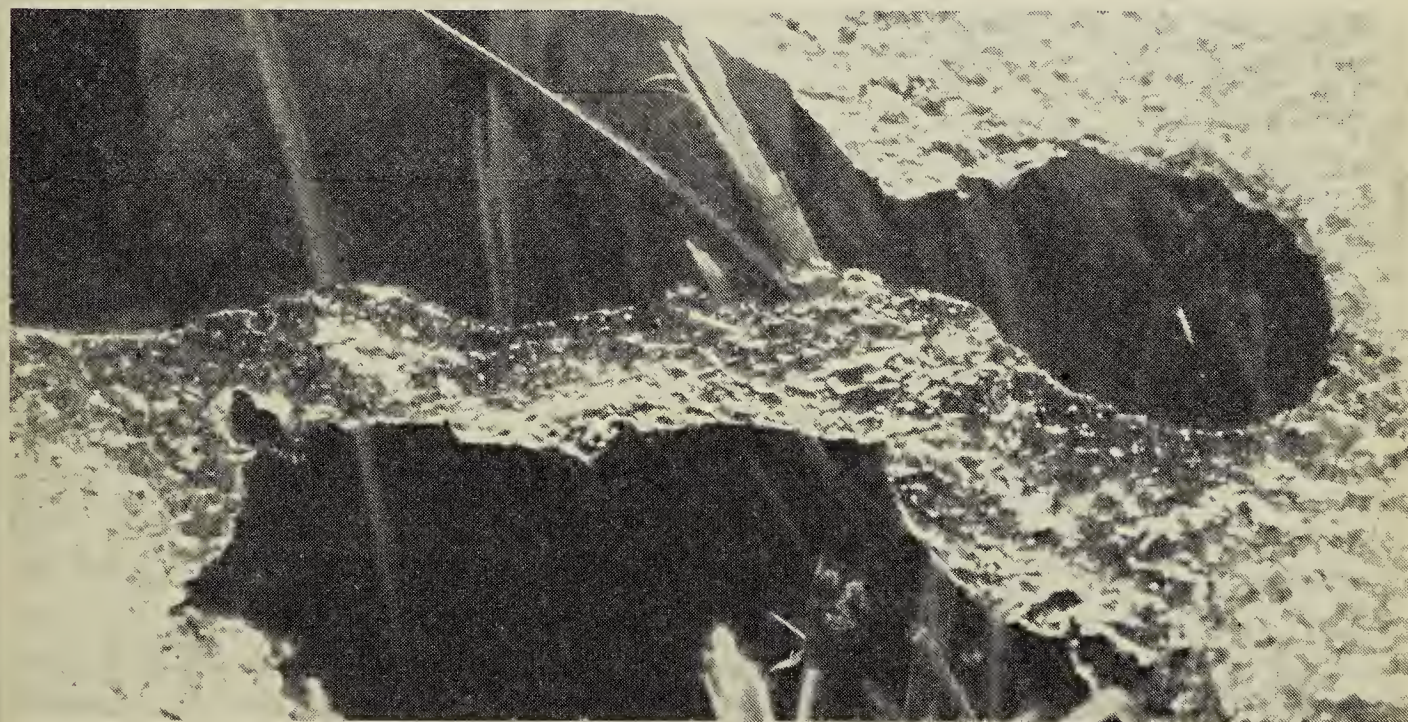
⁴HOLLISTER, N. 1912. Mammals of the Alpine Club Expedition to the Mount Robson region. Canadian Alpine Jour. Spec. No. 1-44.

⁵MILLER, G.S. and G.M. ALLEN. 1928. The American bats of the genera *Myotis* and *Pizonyx*. Bull. U.S. Nat. Mus., 144. 218 pp.

⁶SCHOWALTER, D.B. 1978. Some western Canadian bat records. Blue Jay 36:49-50.

⁷SMITH, H.C. 1977. Little Brown Bats with abnormal dentition. Blue Jay 35:175-177.

⁸SOPER, J.D. 1964. The Mammals of Alberta. Queen's Printer, Edmonton. 402 pp.



An ice bridge

J.B. Gollop