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Improving Height/Age Data From Stem Analysis

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Notes Section

STORERIA DEKAYI TEXANA FROM THE CAPROCK OF NORTHWEST TEXAS -- A specimen of the Texas Brown Snake, *Storeria dekayi texana,* TNHC 41224, was found 29 August 1972, 5 mi east of Crosbyton, Crosby Co, Texas. The nearest records of the species are Wheeler Co, Tx (Raun and Gehlbach, 1972, Dallas Mus. Nat. Hist., Bull. 2, Pt. 1) 135 mi NNE in the Red River drainage; Palo Pinto, Palo Pinto Co, Tx (Brown, 1950, Checklist, Rept. & Amphib. Tex., Baylor Univ. Press) 175 mi ESE in the Brazos drainage; Putnam, Callahan Co, Tx (Brown, *op. cit.*), 150 mi SE in the Colorado drainage; and 13 mi SW San Angelo, Tom Green Co, Tx (ASU 4413), 165 mi SSE in the Colorado drainage. This record extends the known range of the species 175 airline miles up the Brazos River drainage to the base of the caprock. The specimen, when taken by the writer, was crawling on a grassy bank of a small reservoir created behind a dam across the White River approximately 150 m south of US Hwy 82. Other members of the herpetofauna taken include *Natrix erythrogaster transversa, Acris crepitans blanchardi,* and *Rana* sp. (plains form of *pipiens* complex). A single *Rana catesbiana* adult was seen. Brown (*op. cit.),* Conant, 1958 *(A Field Guide to Reptiles and Amphibians,* Houghton Mifflin) and Raun and Gehlbach, (*op. cit.*) do not show this snake in Northwestern Texas. Dr. R. F. Martin confirmed the identification. *Joe Ideker, University of Texas at Austin, P.O. Box 5013, Austin, 78763.*

NOTEWORTHY ADDITIONS TO THE BAT FAUNA OF THE SAN CARLOS MOUNTAINS, TAMAULIPAS, MEXICO -- The San Carlos Mountains consist of a group of ridges and peaks rising from the plain of central Tamaulipas (Dice, 1937, *Univ. Mich. Studies Sci. Ser.,* 12: 245-268). These mountains are of interest biogeographically because they are isolated from the Sierra Madre Oriental bv an extent of desert plain which at the narrowest is 25 mi across (Dice, *op. cit.*). Difficult gravel roads extend into the San Carlos Mountains so access to the area is and has been limited. Consequently, little is known of the chiropteran fauna of these mountains. Dice (*op. cit.*) reported only 2 species of bats, *Myotis velifer and Myotis californicus,* in his account of the mammal fauna of the San Carlos Mountains. Alvarez (1962, *Univ. Kan. Publ, Mus. Nat. Hist.,* 14(15): 363-473) and Villa-R (1967, Los murcielagos de Mexico, Univ. Mexico, Instituto de Biologia, xvi + 491 pp.) added no new chiropteran records.

On 5 March 1972, we had the opportunity to collect bats at a locality in the San Carlos Mountains. Our camp site was a place 1.5 mi NW of Tinaja. Tinaja is a small village located about 10 mi NW of San Carlos along the eastern slopes of the mountains. Our camp was in a small valley at an elevation of 2100 ft. The floor of this valley is dominated by live oaks and pecan trees. The foothills rise from the valley with moderately steep slopes which support a thick growth of thorny shrubs. We strung 2 bat nets across a small, rocky stream bottom. This stream contained only a trickle of water, but a few deeper pools were scattered throughout its length. Our nets traversed the deepest of these pools which was next to a steep limestone bluff. We captured 45 bats of 8 species, none of which have ever been reported from the San Carlos Mountains. A few of these bats also represent noteworthy accounts of the bat fauna of the state of Tamaulipas.

The 8 species from the San Carlos Mountains, all individuals of which were netted over water are: *Mormoops megalophylla megalophylla,* one female; *Lasiurus borealis*

borealis, one male and 2 females; *Lasiurus cinereus cinereus*, one male; *Lasiurus intermedius*, one male; *Lasiurus ega xanthinus*, one female; *Nycticeus humeralis mexicanus*, 17 males and 9 females; *Antrozous pallidus obscurus*, 3 males; and *Tadarida brasilliensis mexicana*, 7 males and 2 females. None of the female bats collected evidenced any signs of reproductive activity.

It is noteworthy that this is the only locality where all 4 species of *Lasiurus* known from Tamaulipas occur sympatrically. The single specimen of *Lasiurus cinereus* represents only the 3rd specimen of this species known from Tamaulipas. Previously, hoary bats were known only from Matamoros (Miller, 1897, *N. Amer. Fauna*, 13: 1-140) and Aserradero del Infernillo (Goodwin, 1954, *Amer. Mus. Novit.*, 1689: 1-16 – cranium only) in Tamaulipas.

Specimens listed above were prepared as conventional study skins and deposited in the Texas Cooperative Wildlife Collection, Texas A & M University. Special thanks are due Dr. Bernardo Villa-R who graciously provided collecting permits for the Republic of Mexico. This paper is contribution no. TA 9985 of the Texas Agricultural Experiment Station. *David J. Schmidly, Fred S. Hendricks, and Carl S. Lieb, Department of Wildlife & Fisheries Sciences, Texas A & M University, College Station 77843.*

IMPROVING HEIGHT/AGE DATA FROM STEM ANALYSIS -- In order to develop mathematical models predicting total tree height as a function of tree age for trees which exhibit excurrent branching, forest biometricians often obtain their sample data from stem analyses. The field procedure in stem analysis for obtaining tree height and values usually consists of:

1) Felling and bucking a tree into bolts of fixed lengths.
2) Counting the growth rings at the stump and at the top of each succeeding bolt and converting the ring count to tree age.
3) Summing the bolt lengths to obtain a tree height value to the top of each bolt.

Using the pairs of tree height and age values, biometricians perform various analyses.

The age determined at the top of each bolt is accurate, but the tree height to this cross section rarely represents the true tree height for that age, because the tree height for the age at a cross section occurs somewhere above the cross section. For a given cross section (or age) of the tree stem, the position of the annual tree height growth apex (ATHGA) is not known. The tree height error involved could range from zero up to several feet. Since disregard of this source of error always underestimates tree height for a given age, it constitutes a consistent bias for which an adjustment should be made.

An adjustment procedure to minimize the tree height error is described below:

1. If the age at the bottom and top of a bolt are identical, proceed to next bolt above.
2. If the age at the bottom and top of a bolt are different, then:
   1) Add one to the age difference.
   2) Divide the length of the bolt by this value.
   3) Add this quotient to the tree height determined to the bottom of the bolt.
   4) The result is the adjusted tree height for the age at the bottom of the bolt.

That is: Adjusted tree height = unadjusted tree height + bolt length/(age difference +1)

The adjustment is designed to provide more accurate tree height values for most samples observed. Several examples will illustrate the adjustment.

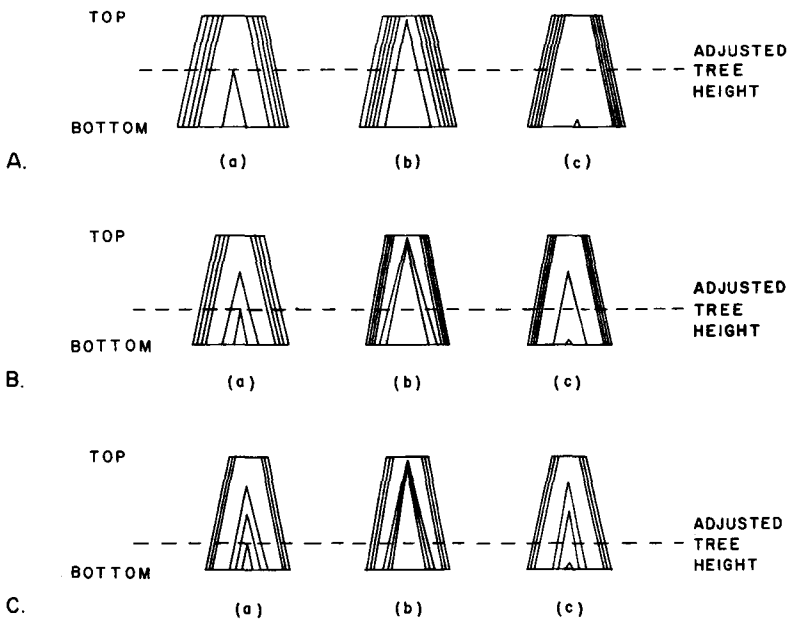

Figure 1. Schematic diagrams of longitudinal sections of bolts showing locations of true and adjusted tree height apexes.
A. Age difference within bolt = 1 year
B. Age difference within bolt = 2 years
C. Age difference within bolt = 3 years

If the age difference is one, the ATHGA for the age at the bottom of the bolt is located somewhere within the bolt length. Figure 1A shows 3 possible locations. After adjustment, the calculated ATHGA position is placed midway along the bolt. If the true position is like Figure 1 Aa, very little error occurs, however if the true position is like Figure 1 Ab or Ac, then the error is about one half the bolt length.

If the age difference is 2, Figure 1 B illustrates 2 possible ATHGA locations. The calculated ATHGA position is 1/3 the bolt length above the bottom of the bolt. The true position could be like Figure 1 Bb, in which case the maximum error occurs. Position shown in Figure 1 Bc will result in an error of slightly less than 1/3 the bolt length. If a large number of samples are measured with this age difference, the average position of ATHGA will probably correspond to Figure 1 Ba.

Figure 1 C pictures 3 ATHGA positions, when an age difference of 3 occurs. The maximum error shown in Figure 1 Cb will probably occur infrequently, while the average

position of ATHGA based on a comprehensive sample will probably be located very close to position shown in Figure 1 Ca.

By following this procedure to obtain age and tree height pairs, the resulting sample set should in all probability be more representative of the true (yet unknown) tree height values. *J. David Lenhart, School of Forestry, Stephen F. Austin State University, Nacogdoches, 75961.* Accepted for publication: August 14, 1972.

REACTIONS INVOLVED IN METABOLIC DEGRADATION OF A BRANCHED DECAGLUCOSE TO α - 1, 4 - TETRAGLUCOSE FOLLOWED BY GLYCOGENETIC REBUILDING OF THE STARTING DECAGLUCOSE

This study was undertaken with a view of defining the final reactions of metabolic glycogenolysis which produce the smallest oligoglucose capable of accepting glucose units in glycogenesis, and the first elongation and branching reactions of glycogenetic buildup of the minimal "primer".

The least oligoglucose which has been reported to serve as a glucose acceptor in cell glycogenesis is α - 1, 4 - tetraglucose, $H(C_6H_{10}0_5)_40H$ (White, *et al.*, 1968, *Principles of Biochemistry*, 4th Ed., McGraw-Hill, N.Y.) Quite regularly, during glycogenetic-glycogenolytic shift, this tetraglucose, along with other glycogen remnants, may be present temporarily in the body system, before being enlarged or further degraded to different glucose pluramers.

Confining the present study to experimentally identified oligomers, we have chosen as a starting substrate for glycogenolytic breakdown a branched decaglucose which itself was obtained by Dr. Joseph Larner as an incomplete degradation product of muscle glycogen. In his series of experiments, Professor Larner did not degrade this 10-mer segment to the smallest possible glycogen building starter. Instead, quite systematically he enzymatically enlarged and twice branched the branched decaglucose, forming finally a 25-mer thrice branched glycogen-like polyglucose (Larner, 1953, *J. Biol. Chem.*, 202:491).

In our study we have traced with condensed structural equations the sequence of reactions by which, during normal metabolism, the Larner branched decaglucose is degraded to α - 1,4 - tetraglucose and this minimum glycogenesis primer is reconverted to the Larner decaglucose. Three degradative and 2 rebuilding reactions constitute this cyclical sequence.

In the first degradative step, the enzyme known as α - 1,4 → α - 1,4 glucan transferase transfers to another pluraglucose molecule the 3-mer nonreducing end of the decaglucose side chain.

$$\begin{matrix} H(C_6H_{10}0_5)_4 \\ H(C_6H_{10}0_5)_3 \end{matrix} \rangle (C_6H_90_5)\,(C_6H_{10}0_5)_20H + H(C_6H_{10}0_5)_n0H$$

Branched decaglucose n-Mer pluraglucose

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