

Morphological Discrimination of Crania of Big-eared Bats in Oklahoma

Renn Tumlison

Department of Biology, Henderson State University, Arkadelphia, AR 71999

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Three taxa of big-eared bats (genus *Corynorhinus*, 1, 2) occur in Oklahoma (3, 4). In eastern Oklahoma, Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*) has been collected from LeFlore and McCurtain counties and the Ozark Big-eared Bat (*C. townsendii ingens*) occurs in Adair County. A separate subspecies of Townsend's Big-eared bat (*C. townsendii pallescens*) occurs in western Oklahoma. Skins of the two species may be distinguished by color of the fur: ventral hairs possess a white tip in *C. rafinesquii* whereas the tip is buff or tan in *C. townsendii*. Handley (3) noted interspecific overlap of cranial characters that precluded positive specific identifications of some specimens.

The primary cranial character used to distinguish these species in state mammal books for Oklahoma (4) and Arkansas (5) is the shape of the first upper incisor. According to Handley (3), *C. rafinesquii* has a bifid incisor whereas this tooth in *C. townsendii* is unicuspid in most populations. However, Handley (3) noted that the Ozark population designated *C. townsendii ingens*, which is the only member of the species in Arkansas and is one of two subspecies in Oklahoma, also possesses a bifid first incisor. Thus, use of this tooth character could cause misidentification of skulls.

During a morphometric study of more than 2,000 skulls of all taxa of Plecotine bats (6), several cranial characters were identified that apparently provide accurate identification among members of the species (see Tumlison and Douglas (1) for a list of specimens examined). Combined, these characters provide accurate discrimination of all *Corynorhinus* taxa in North America, and correct errors that might occur when using keys from state mammal books. Correct identification of crania is especially important because the Ozark Big-eared Bat is an endangered form and Rafinesque's Big-eared Bat is a species of special concern throughout most of its range.

[Text continued on page 58, adjacent to Figure 1]

REFERENCES

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The best single characteristic I have evaluated is the shape of the mastoid region. In *C. rafinesquii*, the mastoids are inflated and appear as small protuberances pointing outward from the skull. In *C. townsendii*, the mastoids follow the curvature of the skull and are barely noticeable from a dorsal perspective (Figure 1A).

The palatal region is extended between the pterygoid processes in both species. This extension, termed the median postpalatal process, typically is larger and sharply triangular in *C. rafinesquii* whereas in *C. townsendii* it is reduced and somewhat rounded (Figure 1B).

The hamulus of the pterygoids is represented bilaterally as a styliiform process. The hamuli of *C. rafinesquii* are enlarged toward the tip and tend to angle away from the midline of the skull. In contrast, hamuli of *C. townsendii* are of approximately uniform diameter and tend to curve slightly toward the midline of the skull (Figure 1C).

The first upper incisor is bicuspid in *C. rafinesquii* and usually is unicuspid in most populations of *C. townsendii*, with the exception of *C. townsendii ingens*, an endangered subspecies restricted to the western Ozark Plateau (3). Specimens from western Oklahoma, of the subspecies *C. townsendii pallescens*, also may possess the accessory cusp. However, the shape of the cusp typically differs between species. The cusp is longer and does not taper distally in *C. rafinesquii*, whereas in *C. townsendii* the cusp, when present, tends to be shorter and tapers from the gum line to just short of the tip of the tooth (Figure 1D).

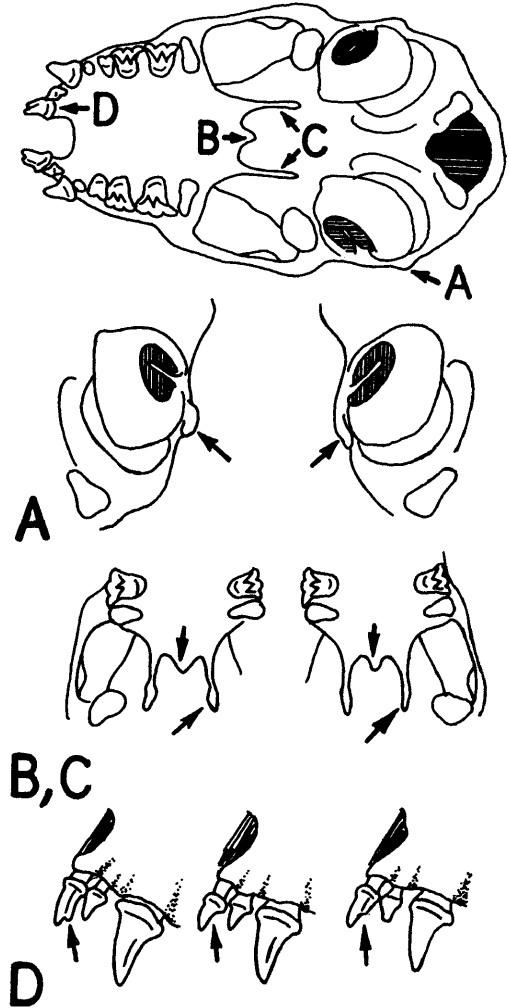


Figure 1. Characteristics distinguishing crania of *Corynorhinus rafinesquii* and *C. townsendii*. Upper illustration depicts ventral view of skull with locations of characters indicated by arrows. Enlargements compare *C. rafinesquii* (left) and *C. townsendii* (right) – A: mastoid region; B: median postpalatal process; C: hamulus of pterygoids; D: first upper incisor (middle and right are *C. townsendii* without accessory cusp and with shorter tapering cusp, respectively).