

Evolutionary Relationships of Living and Extinct Vampire Bats

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Vampire bats (Phyllostomidae: Desmodontinae) are a highly specialized lineage of sanguivores that subsist on the blood of other vertebrates. Numerous lines of evidence have established the monophyly of extant vampire bats, including morphological, molecular, immunological, and chromosomal data. In addition to the three living species, four Pleistocene fossil species of vampires are now recognized: *Desmodus archaeodaptes*, *D. draculae*, *D. puntajudensis*, and *D. stocki*. The relationships of extinct vampire bat taxa can only be assessed through examining their preserved fossil remains. Unfortunately, much of the bat fossil record consists of fragmentary evidence, particularly teeth. In order to assess the phylogenetic relationships of fossil and living phyllostomids we are building an online morphological database of bat dental data using MorphoBank. Analyses of 279 dental characters, combined with molecular evidence, allow placement of organisms represented by fossils into phylogenies to evaluate their relationships to extant forms. We evaluated the relationships of living vampires to other phyllostomids using >8,000 bp from 7 nuclear and 5 mitochondrial genes, and found support for placement of desmodontines among the basal branches in Phyllostomidae. Using the molecular tree as a scaffold, we assessed relationships of those fossil vampires for which dental remains are known. Details of dental morphology were assessed using light microscopy, digital photography, and CT scanning. Our findings support monophyly of *Desmodus* including the fossil species attributed to the genus.

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