68th Annual Meeting
Society of Vertebrate Paleontology

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phylogeny. The measurements include coiling of the cochlea, the radii of curvature of the semicircular canals, and angular deviations of the canals to their respective planes. The morphology of the bony labyrinth of zhelestids is consistent with that of other fossil and extant eutherians. One notable feature present in the inner ear of zhelestids is the secondary common crus, which is a fusion of the lateral and posterior semicircular canal that enters the posterior ampulla. The cochlea also coils between one and one and a half turns. The isolated zhelestid petrosals likely represent more than one species since several zhelestid species are recognized based on teeth, but the degree of variation observed in the sample compares favorably to that observed within single extant mammal species. The planarity of the semicircular canals, or how well a canal fits onto a single plane, was the most variable feature. The coiling of the cochlea and radii of curvature of the canals do not vary significantly in the specimens examined, indicating that there is little variation between individuals within species, or among closely related species in the case of zhelestids. The morphology of the bony labyrinth of zhelestids is phylogenetically uninformative. Both the secondary common crus and a cochlea completing just over one turn are ancestral features of thiran mammals, which would be consistent for excluding zhelestids from crown Placentalia. However, these characteristics are present in some members of the crown, so the morphology of the inner ear can neither include nor exclude zhelestids from Placentalia.

Technical Session VI, Thursday 1:45
ROUGHING IT: DENTAL COMPLEXITY IN BAMBOO FEEDERS AND THE INHERENCE OF MINSIC ENVIRONMENTS
EVANS, Alison, Institute of Biotechnology, University of Helsinki, Finland; ZOHID, Sarah, Institute of Biotechnology, University of Helsinki, Finland; WRIGHT, Patricia, Stony Brook University, Stony Brook, NY, USA; JERNVALL, Jukka, Institute of Biotechnology, University of Helsinki, Finland

Bamboos, grasses belonging to the family Poaceae, are highly fibrous, with culms containing close to 50 percent cellulose. This together with phylooliths makes bamboo a challenging food to consume and digest. Specialization for bamboo feeding has evolved several times in mammals. Primates, bears, and murid rodents all have living species that rely largely on a bamboo diet. While phylogeny, size, and life history are highly divergent among these bamboo specialists, they do share some adaptations to feeding on bamboo. One shared feature is dental morphology, and here we apply a 3-dimensional method to assess crown feature complexity, or surface roughness, in bamboo eating lemurus, pandas, and rodents. Our analyses of dentitions show that bamboo specialists have highly complex cheek tooth morphology irrespective of the taxon-specific morphological details. The high complexity values can be related to the high number of tooth crown features, or ‘tools’, required to process fibrous bamboo. In addition to comparable levels of high dental complexity, all the studied taxa have low tooth crowns. This is in stark contrast to the tall teeth of ungulates feeding on grass in open and more seasonally dry environments. Furthermore, with more pronounced dry seasons, the ranges of the bamboo feeders with the most complex teeth have contracted. These results suggest that fossil taxa with dental complexity comparable to modern day bamboo feeders can be used to infer moist conditions.

New Directions in the Study of Fossil Endocasts: a Symposium in Honor of Harry J. Jerison, Thursday 8:30
ENDOCRANIAL ANATOMY OF LAMBEOSAURINE DINOSAURS: IMPLICATIONS FOR CRANIAL CREST FUNCTION AND EVOLUTION
EVANS, David, Royal Ontario Museum, Toronto, ON, Canada; WITMER, Lawrence, Ohio University, Athens, OH, USA; RIDGELEY, Ryan, Ohio University, Athens, OH, USA; HORNER, John, Museum of the Rockies, Bozeman, MT, USA

Interpreted in a phylogenetic context, brain endocast and nasal cavity morphology and ontogeny represent powerful tools to test functional hypotheses in extinct vertebrates. In order to test hypotheses of cranial crest function, endocasts of six corythosaurian lambeosaurines were generated through computed tomography and three-dimensional rendering and visualization software. The specimens represent a range of ontogenetic stages from the taxa Lambeosaurus, Corythosaurus, and Hypacrosaurus. The morphology of brain endocasts in lambeosaurines differs little from that of hadrosaurines. The undivided olfactory region confirms that the olfactory bulbs were small and proximally situated with respect to the hemispheres. The hemispheres form a relatively large proportion of the overall size of the endocast, accounting for approximately 43% of the total endocranial volume at all ontogenetic stages. Relative to total endocast volume, the cerebrum is larger than that of many omnivorous and large theropods, but compares favorably to the maniraptoran theropod Conchoraptor (43%) and Archaeopteryx (45%) of considerably smaller body size. The nasal cavity reconstructions of juvenile Lambeosaurus, Corythosaurus, and Hypacrosaurus stehingeri are very similar, and appear relatively consistent with their reconstructed adult conditions. The vestibule forms the largest part of the nasal cavity, and the main olfactory region is closely associated with the olfactory bulbs and outside of the main airway. In Hypacrosaurus altispinus, the nasal vestibule is strikingly elongated and convoluted compared to all other corythosaurs. When interpreted in the context of lambeosaurine morphology, this suggests a strong selective pressure for nasal cavity function that operated independently from changes in the external shape of the crest. The vestibular apparatus reveals for the first time that the detailed structure of the lambeosaurus inner ear closely resembles that of hadrosaurines, and therefore confirms key assumptions of previous estimates of auditory sensitivity in the group as it relates to the resonation model of crest function.

Edwin H. and Margaret M. Colbert Poster Competition (Thursday)
MAMMALIAN MIGRATION PATTERNS IN TIMES OF GLOBAL WARMING - IMMIGRATION AND LOCAL EXTINCTION IN CENTRAL EUROPE AT THE END OF THE LAST GLACIAL
FAHLKE, Julia, Steinmann Institute for Geology, Mineralogy, and Palaeontology/Bonn University, Bonn, Germany

The late phase of the Last Glacial (Weichselian/Würmian in Central Europe, corresponding to the American Wisconsinian) was a time of discontinuous but overall climatic amelioration, characterized by cooler and warmer intervals (stadials and interstadials), and followed by the marked Holocene warming. Mammal species are adapted to their respective habitats, including the restriction to or preference for certain climatic conditions. In times of favorable climate, populations expand their distribution ranges from core areas to temporary distribution areas. When the climate deteriorates (with respect to the specific requirements), they do not, as often suggested, emigrate, following the suitable climate, but go locally extinct. Throughout the Pleistocene Central Europe served as such a temporary distribution area. During interglacial mammal species requiring temperate conditions immigrated