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SOCIETY OF VERTEBRATE PALEONTOLOGY
OCTOBER, 2012
ABSTRACTS OF PAPERS
SEVENTY-SECOND ANNUAL MEETING

Raleigh Convention Center
Raleigh, NC, USA
October 17-20, 2012

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Esteemed Friends and Colleagues of the Society of Vertebrate Paleontology,

The Host Committee of the 72nd Annual Meeting welcomes members and student members of the Society of Vertebrate Paleontology to Raleigh, North Carolina, where you can experience first-hand a bit of southern hospitality. Your Host Committee consists of individuals representing a number of institutions and whose research interests encompass many facets of the discipline of vertebrate paleontology.

The principal institutions hosting this year’s meeting are the North Carolina Museum of Natural Sciences and North Carolina State University. The theme for this year’s meeting emphasizes the Triassic roots of North Carolina paleontology, and we hope that you take advantage of the chance to learn about some of our spectacular specimens. Our rich Cenozoic deposits have yielded marine faunas including large cetaceans and sharks, and our scheduled field trips focus on these fantastic deposits. For those whose interests lie towards more human-oriented questions, another field excursion offers a rare opportunity to visit the Duke Lemur Center, the world’s largest sanctuary for rare and endangered prosimian (strepisirhine) primates, and includes a visit to collections at the Division of Fossil Primates.

Raleigh is a small city, by most standards, but is very cosmopolitan, and easily accessible from any airport on the East coast, usually with direct flights. Raleigh is a premier travel destination, and presents visitors with a surprising diversity of ethnic cuisines and cultural opportunities, as well as more traditional southern cooking and hospitality. Our beautiful downtown area, within walking distance from the museum, offers many restaurants with a wide selection of food and drink, and many featuring outdoor seating, a real treat for socializing with colleagues on warm October evenings.

We warmly welcome you with a reception at the North Carolina Museum of Natural Sciences, where we will highlight our new Nature Research Center. While most traditional museums present a public face to the question “What do we know?,” our new research facility is committed to bringing to the public a deeper awareness of the process of science, by emphasizing in all exhibits “HOW do we know what we know.” To this end we have developed many ‘citizen science’ activities, and encourage public participation in research through more accessible, continually updated exhibits. We hope that you enjoy all the highlights of our museum, our city and our state as you take part in the 72nd Annual Meeting of the Society of Vertebrate Paleontology. Welcome to the City of Oaks!

72nd Annual Meeting Host Committee

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SVP Abstracts are reviewed by the Program Committee and occasionally by outside reviewers. Authors are responsible for the technical content of their articles.

Unless specified otherwise, coverage of abstracts presented orally at the Annual Meeting is strictly prohibited until the start time of the presentation, and coverage of poster presentations is prohibited until the relevant poster session opens for viewing. As defined here, “coverage” includes all types of electronic and print media; this includes blogging, tweeting, advanced online publication and other intent to communicate or disseminate results or discussion presented at the SVP Annual Meeting.

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ONTGENY OF THE EARLY TRIASSIC THRXINAXODON LIOHRINUS (THERAPSIDA, CYNOdontIA). DENTAL MORPHOLOGY AND REPLACEMENT ABDALA, Fernando, Bernard Price Institute for Palaeontological Research, Johannesburg, South Africa; JASINSKI, Sandra, Department of Zoology, Cape Town, South Africa; FERNANDEZ, Vincent, Bernard Price Institute for Palaeontological Research, Johannesburg, South Africa

The non-mammalian cynodont Thrxinaxodon liorhinus is one of the most common representatives of the post-Permian-extinction fauna of the Lystrosaurus Assemblage Zone of the South African Karoo Basin. Thrxinaxodon is also one of the best known Triassic cynodonts with a well-known cranial-dento and postcranial anatomy. Here we present a detailed study on variation of the dental morphology and replacement in Thrxinaxodon liorhinus. For this study we analysed five specimens ranging from 37 to 87 mm in skull length using micro computed tomography (µCT) scanning techniques, which were supplemented by detailed anatomical analysis of 41 specimens with a basal skull length of approximately 30 mm to 96 mm. Our results confirm the alternate replacement of the postcanines and the posterior migration of the postcanine series (including the loss without replacement of the anterior-most postcanines). Even when most of the observations point to a posterior-to-anterior replacement wave, the evidence is not clear-cut. A new classification was designed to describe accurately the morphology of postcanines, taking into consideration the number of sectorial cusps, presence and pattern of the lingual cingulum, and presence of labial cingular cusps. The lower postcanines are more clearly more complex (and more numerous) than the upper postcanines; only the lower postcanines have more than three sectorial cusps and a cingular collar on the lingual margin. Complexity of the postcanines increases from the smallest individual to specimens of 75 mm of skull length, but complexity decreases in larger specimens. On several specimens, erupting canines can be observed through the replacement pit while the complexity of the replacement pattern was assessed using X-ray micro-computed tomography. The virtual extraction of functional and replacement teeth permitted us to conclude that in most of the cases, the upper canines were replaced anteriorly while lower canines were replaced posteriorly. The presence of two simultaneous replacements of the upper canine tooth was observed in two small juveniles, suggesting a higher rate of canine replacement at younger age. Incisors also had a sequential replacement pattern, and more replacement teeth were present in medium-sized individuals.

Poster Session IV (Saturday, October 20, 4:15 - 6:15 pm)

VERTEBRATE AND GEOLOGICAL SIGNATURES ON THE CONSTRUCTION OF MOGhra FORMATION, NORTH WESTERN DESERT, EGYPT ADDEL GAWAD, Mohamed K., Cairo University, Giza, Egypt; MILLER, Ellen, Wake Forest University, Winston-Salem, NC, United States; SUBREY, Mohamed, Cairo University, Giza, Egypt; EL BARKOOKY, Ahmed, Cairo University, Giza, Egypt; EL SHARKAWI, Mohamed, Cairo University, Giza, Egypt

Information from the geology and paleontology of Wadi Moghra, early Miocene, Qattara Depression, Egypt combine to indicate the Moghra animals occupied a tide-dominated estuary paleoenvironment. Work on the sedimentology of the area reveals that the Moghra Formation is characterized by a series of shale-sandstone interbedded units, with an ichnofossil assemblage comprised of Ophiomorpha, which indicate an intertidal zone, and Thalassinoides, which indicate a subtidal environment. The root system of mangroves with complete dentary, long, slender limbs, pelvic elements, amphicoelus vertebrae, and small, square osteoderms. The second crocodyliform taxon from Proctor Lake includes skulls from two individuals, limb elements, prococelous vertebrae, and isolated teeth. This last taxon represents one of the most derived taxon of non-eusuchian Crocodyliformes in Texas with an internal choanae situated at the posterior edge of the suborbital fenestra and bordered anteriorly by the palatines and by the pterygoids posteriorly and laterally. A phylogenetic analysis recovered this new crocodyliform as the sister taxon to the Glen Rose Crocodyliformes. Together, all three expand the taxonomic diversity of the Early Cretaceous units of Central Texas and increase our knowledge on the evolutionary patterns within Crocodylomorpha.

Technical Session XVIII (Saturday, October 20, 3:00 pm)

THE MECHANICS OF FOSSORIALITY IN MAMMALIA AND THE Locomotor BEHAVIOR OF PALEANOdONTA (PHOLIDOTAMORPHA) AHIRENS, Heather E., Johns Hopkins School of Medicine, Baltimore, MD, United States; RUFF, Christopher B., Johns Hopkins School of Medicine, Baltimore, MD, United States; ROSE, Kenneth D., Johns Hopkins School of Medicine, Baltimore, MD, United States

Fossoriality has evolved multiple times within Mammalia, providing numerous examples of adaptive convergence. Some of the most cited examples of morphological convergence in the postcranium include additional fusion in the vertebral column, a stout humerus with prominent muscle attachments, a long and inflected olecranon process, and a broad olecranon with fusions and additional sesamoids. Despite many descriptive studies, there are few taxonomically broad biomechanical analyses of fossoriality in mammals. The goals of this project were to use beam modeling and mechanical advantage of long bones to determine whether different digging modes could be distinguished in extant taxa and to determine the locomotor behavior of Paleanodont, an extinct Paleogene group that includes taxa hypothesized to be moderately to extremely fossorial. The extant sample included eleven species, nine fossorial and two generalized, and the fossil sample included five species of Paleanodonts. The number of fossils was restricted for nearly complete specimens. Anteroposterior and mediolateral breadth measurements of the humerus and femur were used to calculate polar section modulus (Zp) and polar second moment of area (J), which measure bending and torsional strength and rigidity, respectively. Length of the olecranon process and total length of the ulna were used to calculate mechanical advantage of the ulna. 95% prediction intervals constructed from non-parametric bootstrapping (our largest modern sample) and analyses of variance (ANOVA) on the residuals from the regression of scratch diggers were used to assess whether there was a distinction between the following locomotor modes: generalized (non-fossorial), scratch, hook and pull, humeral rotation, and head lift. Humeral rotation and head-lift digging can be distinguished from scratch digging on the basis of humeral bending and torsional strength and rigidity, as well as the mechanical advantage of the ulna on the basis of both the ANOVA and examination of prediction intervals. Femoral strength and rigidity were significantly different in the extant ANOVA, however, individuals of all locomotor modes fell within the 95% prediction intervals. Though none of the paleanodonts sampled exhibited mechanical measures outside the range of extant mammals, the group is characterized by an increased mechanical advantage of the ulna compared to extant fossorial mammals of similar body size. Most paleanodonts were likely scratch diggers, with only Diposalis oxytes recovered as a head-lift digger. The discrimination of more than one locomotor style in Paleanodonts provides promising results that suggest these three mechanical properties can detect differences in digging mode in other extinct mammals.

Poster Session III (Friday, October 19, 4:15 - 6:15 pm)

ENCEPHALIZATION AND BRAIN MORPHOLOGY IN EXTINCT, FALSE SABER-TOOTHED CATS (BARBOUREFELIDAE) AND BARBOUREFELIDAE, David M., Institut Català de Paleontologia Miquel Crusafont, UAB, Barcelona, Spain; FORTUNY, Josep, Institut Català de Paleontologia Miquel Crusafont, UAB, Barcelona, Spain; DE ESTEBAN-TRIVIGNO, Soledad, Institut Català de Paleontologia Miquel Crusafont, UAB, Barcelona, Spain; ROBLES, Josep M., Institut Català de Paleontologia Miquel Crusafont, UAB, Barcelona, Spain; ALMECIDA, Sergio, American Museum of Natural History & NYCEP, New York, NY, United States

Barbourofelids are an extinct family of feliform carnivores from the Miocene of Africa, Eurasia and North America, including the paraphyletic Afromelina and the more derived and monophyletic Barbourofelinae (Sansanosmilus, Alamosmilus and Barbourofelis). Barbourofelids evolved a saber-toothed phenotype independently from niromavids and the saber-toothed felids (Machairodontinae). In North America, barbourofelines coexisted for several million years with macheirodonts, but in Europe the former became extinct short after the arrival of the latter. According to published endocast descriptions of Sansanosmilus and Barbourofelis, barbourofelids would display an archaic sulcal pattern more similar to that of niromavids than to that shared by macheirodontines and saber-toothed felids, thus suggesting the existence of cognitive differences between both groups. This is tentatively supported by published brain volume estimations based on external neurocranial measurements. In order to further evaluate the differences in brain morphology and encephalization between barbourofelids and macheirodontines, here we report two barbourofelid endocranial endocasts based on computed tomography (CT) scans of

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- MERCHANDISE SALES
- LOUNGE
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