JVP

Journal of Vertebrate Paleontology

Program and Abstracts

Volume 27, Supplement to Number 3
12 September 2007

67th Annual Meeting
Society of Vertebrate Paleontology

The Jackson School of Geosciences
University of Texas
Austin, Texas USA
October 17-20, 2007

Society of Vertebrate Paleontology
ISSN 0272-4634

except for size. Only the large species is present in the Brooksville 2 fauna, where a better sample is available including an upper molar and all of the lower teeth except the incisors. The Brooksville 2 local fauna represents the late early Arikareean LMA (25-28 Ma; late Oligocene). Each of the two species is represented by a single tooth in the I-75 local fauna, which we interpret as being late Whitneyan LMA (about 30 Ma; late early Oligocene) in age. Parsimony analysis of available dental-osteological data suggests that the new bats are sister to a mystacinid-noctilionid-mormoopid clade, which in turn is sister to Phyllostomidae. The two species of the new family co-occur in the same localities with a new genus and species of mormoopid; together the three are the earliest known representatives of the Noctilionoidea. The age of these specimens more than doubles the known time depth of the noctilionoid lineage, previously known back to 12-13 Ma (Laventan LMA) in South America. Both of the Florida localities reflect deposition in paleokarstic situations and suggest a probable cave-dwelling habit for the bats. Several other families of bats also occur in various other late Oligocene and early Miocene sites in Florida (Emballonuridae, Mormoopidae, and Natalidae). Biogeographically, the occurrence of the new noctilionoids and these other families in what is now peninsular Florida, where these groups no longer exist, bolsters other faunal data suggesting a subtropical to tropical aspect to the Florida paleoenvironment in the middle Cenozoic, and a Neotropical influence or possible tropical North American origin for the Noctilionoidea.

Poster Session IV (Saturday)

THE FIRST DEFINITIVE TITANOSAUR (SAUROPODA) OSTEODERM FROM INDIA AND THE NATURE OF THE TITANOSAUR OSTEODERM RECORD

D'EMIC, Michael, University of Michigan, Ann Arbor, MI, USA; WILSON, Jeffrey, University of Michigan, Ann Arbor, MI, USA; CHATTERJEE, Sankar, Texas Tech University, Lubbock, TX, USA

Titanosaurs are the only sauropods that possessed osteoderms, although the phylogenetic distribution of this feature within the clade is not yet resolved. Whereas the majority of titanosaur osteoderms are from South America, several have been found in Cretaceous rocks in Africa, Madagascar, and Europe. Here we describe a titanosaur osteoderm from the Maastrichtian of India that extends the known geographic range of these "armored" sauropods. The element, originally found and ascribed to an ankylosaur by Barnum Brown in 1922, is one of the largest known osteoderms. It is elliptical and bears a convex external surface and a flat internal surface. The external surface is heavily ornamented and the internal surface bears a crosshatched texture similar to that seen in other archosaurs. Its edges are rugose and lack articular surfaces, suggesting that it did not have bony contact with other osteoderms. This appears to be a general pattern for titanosaur osteoderms. This Indian element is most similar in shape and size to osteoderms recovered from the Early Cretaceous of Mali and Malawi. The spatiotemporal distribution of titanosaurs is broader than the distribution of titanosaur osteoderms, which implies that (1) few titanosaur genera had osteoderms, (2) titanosaurs were not heavily armored, and/or (3) there are strong collection and taphonomic biases against these elements. More than 80 individual titanosaur osteoderms have been reported in the literature and can be assigned to ten of the 41 currently recognized titanosaur genera. Although they are not divisible into discrete size classes, titanosaur osteoderms are here shown to fall into four morphotypes: "ellipsoid," "keeled," "puck," and "ossicle." No morphotype is unique to any one taxonomic group, geographic area, or time period. Despite the relative scarcity of osteoderms, all known osteoderm-bearing titanosaurs are relatively diminutive in body size, with average femoral and humeral lengths that are 50% and 60% of the lengths of "unarmored" taxa, respectively.

Technical Session VII, Thursday 3:45

CLADISTIC ANALYSIS OF THE ENCHODONTOIDEI (TELEOSTEI: AULOPIFORMES)

DA SILVA, Hilda, Universidade do Estado do Rio de Janeiro, Instituto de Biologia, Departamento de Zoologia, Rio de Janeiro, Brazil; GALLO, Valéria, Universidade do Estado do Rio de Janeiro, Instituto de Biologia, Departamento de Zoologia, Rio de Janeiro, Brazil

Enchodontoidei are represented by extinct marine teleosts, generally with an elongate body, and long and narrow rod-like maxilla included in the mouth gape. They possess a long temporal range, extending from the Early Cretaceous to the Early Eocene, and a wide geographic distribution, being found in sedimentary deposits of South America (e.g., Bolivia and Brazil), Africa (e.g., Democratic Republic of Congo, Egypt, and Morocco), Europe (e.g., Belgium, England, Germany, Holland, Italy, and Sweden), Asia (e.g., Arabian Peninsula, India, Israel, Japan, and Lebanon), and North America (Canada, Mexico, and United States). Due to the lack of a comprehensive phylogenetic study for Enchodontoidei, we performed a parsimony analysis using a data matrix built with 87 characters, 31 terminal taxa for ingroup, and three taxa for outgroup. A heuristic algorithm of the computer program PAUP* 4.0b10 was used. The analysis produced 52 equally parsimonious trees, with 435 steps, consistency index of 0.24, and retention index of 0.49. The strict consensus tree is represented by the following topology: ((((new Brazilian Aulopiformes, (*Protostomias, (Yabrudichthys, Apateopholis))), (Trachinocephalus, (Apateodus), (Ichthyotringa), ((Apuliadercetis), (Caudadercetis, (Pelargorhynchus, (Nardodercetis, (Rhynchodercetis, (Hastichthys, Dercetoides)))), (Benthesikyme), (Cyranichthys, Robertichthys), (Dercetis, Ophidercetis), (Brazilodercetis))), (((Serrilepis, (Cimolichthys, (Parenchodus, (Enchodus, (Palaeolycus, (Eurypholis, Saurorhamphus)))))), (Halec, Phylactocephalus)), (Prionolepis)), (Hemisaurida)), (Rharbichthys)), Nardorex*). This analysis revealed that Enchodontoidei is not a monophyletic group, not allowing a new taxonomic classification for Enchodontoidei in the cladistic context. Also, the Apateopholidae is not a monophyletic group due to *Apateopholis* is sister-group of *Yabrudichthys*. The Dercetidae forms a clade supported by a single synapomorphy (very reduced neural spine) and shows a new arrangement. The Enchodontidae is monophyletic, but excluding *Rharbichthys* for its composition. Yet, the Halecidae possesses a new arrangement, with the exclusion of *Hemisaurida*. *Nardorex* and *Prionolepis* are Aulopiformes *incertae sedis*.

Technical Session VII, Thursday 2:00

NEW DATA ON *HYNERIA LINDAE* (SARCOPTERYGII; TRISTICHOPTERIDAE) FROM THE LATE DEVONIAN OF PENNSYLVANIA, USA

DAESCHLER, Edward, Academy of Natural Sciences, Philadelphia, PA, USA; SHUBIN, Neil, University of Chicago, Chicago, IL, USA

Hyneria lindae was the first taxon described from the Red Hill locality in Pennsylvania (Catskill Formation; Upper Devonian). A renewed collecting effort at the site beginning in 1993 has recovered a diverse flora and fauna including abundant new material of *H. lindae* that informs an amended diagnosis and phylogenetic treatment of the taxon. New material of *H. lindae* from Red Hill includes lower jaws, palate, snout, cheek, and skull roof as well as fin elements and abundant scales. Closely related tristichopterids from other Late Devonian sites around the world add paleobiogeographic context to the Pennsylvania discoveries. The monophyletic Tristichopteridae is characterized by cycloid scales with a median boss, vomers with a long caudal process, and the presence of a postspiracular bone. Features that *H. lindae* shares with other derived tristichopterids include contact between the lacrimal and posterior supraorbital that excludes the jugal and postorbital from the orbital margin, presence of a premaxillary fang, and lack of contact between the posterior supraorbital and intertemporal. Features unique to *Hyneria* include cycloid scales with a deeply folded margin along the trailing edge and wide vomers with a caudal process that extends at least 45% of the length of the parasphenoid. Preliminary cladistic analysis places *H. lindae* as the sister group to the large, derived, Famennian-age *Eusthenodon* spp. from Greenland, Russia, Belgium, Australia and South Africa. This cosmopolitan distribution suggests that intercontinental dispersal of these tristichopterids was possible during the Famennian Age when Euramerican and Gondwanan landmasses moved into closer proximity. Although *H. lindae* has only been recognized from the Red Hill site, rediagnosis of the taxon allows identification of *Hyneria* sp. from at least two other Catskill Formation sites in Pennsylvania.

Technical Session IV, Wednesday 3:15

THE ROLE OF SOFT TISSUES IN SEDIMENT INFILLING AND PATTERNING: AN ACTUALISTIC STUDY WITH OSTRICH HEADS

DANIEL, Joseph, Ohio University, Athens, OH, USA; WITMER, Lawrence, Ohio University, Athens, OH, USA

Soft-tissue reconstruction in extinct animals is complicated by its rare and ambiguous preservation. A potentially new source of data may be found in the sediment that buries the body. Patterns within the sediment may be due to factors inherent in sediment infilling, biological activity, or some combination. Due to their complicated construction, fleshy heads and dried skulls may sort sediment, and this sorting may be influenced by soft tissue. If this hypothesis is corroborated, anatomical information may remain in the matrix even after the tissue degrades. CT scans have revealed density variations within several fossil skulls. The layered matrix in a *Hypacrosaurus* premaxilla may be explained solely by physical processes, but more difficult to explain is why matrix within the pneumatic sinuses of *Nanotyrannus* is lower in density compared to matrix elsewhere in the skull. To address this question, we are performing actualistic taphonomic studies using two flumes designed to emulate salient aspects of river deposition while controlling the aqueous depositional environment and sediment composition: one uses deep, slow-moving water, the other shallow, fast-flowing water. After burial in the flumes, ostrich heads were CT scanned and sediment patterns mapped. Sediment samples were taken from different parts of some sectioned heads for comparison with density measurements from the CT scans. Differences in sediment patterns were found in ostrich heads of various initial states (fresh, dried, partially decomposed, and clean skulls). For example, quick burial with wet sediment partially filled the oral and nasal cavities, but air remained in all sinuses. Fresh heads buried in the deep flume for over 14 hours retained air in the paratympanic sinuses, but water and sediment filled the remaining sinuses and cavities. These data provide a baseline for interpretation of CT scans of matrix-filled fossils, possibly allowing us to extract more anatomical information. It may also allow us to identify optimal soft-tissue preservational environments, such that fieldwork can target promising rock units. Further work will be done on long-term burials of ostrich and pig heads.