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New Genera and Species of Fossil Marine Amioid Fishes (Actinopterygii, Holostei) from the Late Cretaceous Agoult locality in Southeastern Morocco

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increased developmental age in two of the specimens. Additionally, developmental and growth patterns including the rapid fusion and obliteration of the mandibular suture and the widening of the mandible at the suture were identified. The concentration of Haversian canals along the occlusal margin and lingual ridges suggests remodelling as a histological response to high levels of repeated stress. These descriptions add to our knowledge of the growth and development of Caenagnathidae and the identification of an ontogenetic series may aid in the taxonomic classification of partial or incomplete caenagnathid skeletons.

Postcer Session I (Wednesday, August 23, 2017, 4:15 – 6:15 PM)

THIERAN MAMMALS FROM THE LOWER BLACK PEAKS FORMATION, BIG BEND NATIONAL PARK, TEXAS ARE TORREJONIAN, NOT PUERCAN, IN AGE

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The early Paleocene mammal faunas from the Black Peaks Formation, Big Bend National Park, Texas, represent the southernmost of North America and thus are important for understanding mammalian diversity and biogeographic patterns following the end-Cretaceous mass extinction. Some workers have argued the faunas from the lower parts of the Black Peaks Formation are Puercan in age based primarily on fossils collected from localities in or near the Dawson Creek area: TMM 41406 (LSU VL-111); “Tom’s Top”) in Dawson Creek and TMM 43237 (LSU VL-108); “Dogie”) from nearby Rough Run Amphitheater about 5 miles (8 km) east of the Dawson Creek section. “Tom’s Top” and “Dogie” have yielded diverse microvertebrate assemblages that are 20 m and 80 m, respectively, above the highest occurrence of dinosaur bones in those areas. A re-evaluation of these faunas indicates that they are Torrejonian rather than Puercan in age. The therian mammals from “Tom’s Top” includes a new small species of the carnivornorph Barynictis, the eucarchotan Mixodectes malaris, the plesiadapiform Plesiolestes wilsoni, and the “condylarth” Promolochia cf. P. lemasurieris. “Dogie” contains a more diverse fauna including Pterodactylus and a new unidentified cimolostomid, the new small species of Barynictis, and six “condylarths”; cf. Goniacodon levisanus, Periptychus carinidens, Haploconus sp., Ellipsoidosuchus cf. E. inaequidens, and a new species of Molochia. The presence of Periptychus carinidens indicates a Torrejonian age for the latest Puercan formation. The other mammals present a consistent with a Torrejonian age assignment. Several of the mammalian genera appear to be restricted to the American Southwest supporting the presence of a distinct southern continental mammalian faunal province during the Torrejonian.

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Technical Session XVI (Saturday, August 26, 2017, 11:00 AM)

A NEW CENTOSAURINE CERATOPSID FROM THE UPPER CRETACEOUS TWO MEDICINE FORMATION OF MONTANA AND THE EVOLUTION OF THE "STYRACOSAURUS" DINOSAURS

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The Late Cretaceous Two Medicine Formation of northwestern Montana has produced numerous remains of centrosaurine ceratopsids, from which three stratigraphically separated genera: Styracosaurus atropogon, Einiosaurus procurvicornis, and Achelousaurus horneri, are currently recognized. B. bighornensis, the stratigraphically lowest at 60 meters below the upper contact with the Bearpaw Formation, is diagnosed by a parietal with medially inclined p3 processes, elongate P4 and P5 processes, and a tall, erect nasal horn. This taxon was originally known only from the isolated holotype parietal and first-name new Styracosaurus ovatus. With the recent referral of the more complete MOR 492 to S. ovatus, new characters were attributed to this taxon which separated it from Styracosaurus and created the need for the new genus name B. bighornensis. Here we reassess MOR 492 and provide evidence that it is not referable to S. ovatus. Rather than possessing seven parietal processes (P2-P7) per side, with elongate P4 and P5 processes as previously thought, MOR 492 only exhibits six processes (P2-P6) per side. This is supported by imbrication of the two anteriormost processes (P6 and P7), as conserved in all two Medicine Formation centrosaurines. With P6 and P7 identifiable, P5 is demonstrably non-elongate and P4 only somewhat elongate, unlike S. ovatus. Further, there is no evidence that the preserved P3 process of MOR 492 was medi ally inclined, but rather the anteroposteriorly near-straight lateral bar of MOR 492 produces a posteriorly inclined P5, as observed in the stratigraphically higher Styracosaurus bighornensis. Therefore, the characters from MOR 492 used to erect B. bighornensis no longer pertain to the diagnosis of S. ovatus, making B. bighornensis a junior synonym of S. ovatus. S. ovatus is a genuine taxon represented only by the holotype.

MOR 492 possesses a unique combination of characters drawn from Styracosaurus albertensis and E. procurvicornis, which is consistent with its intermediate stratigraphic placement and recovered phylogenetic position, and warrants diagnosing a new taxon. Like Styracosaurus, MOR 492 possesses an elongate, erect nasal horn, but like Einiosaurus it exhibits a small, medially inclined P4. Thus, MOR 492 differs from Styracosaurus by the presence of more laterally elongated and characterized by a more medially inclined P3 process, shorter P6 and P7 processes, and straightened lateral margin. Additional, it lacks the presence of a large spinous process on the frontoparietal and possesses a shorter posteriorly directed squamosal process.

New Genera and Species of Fossil Marine Amioid Fishes (Actinopterygii, Holostei) from the Late Cretaceous Agoutli Locality in Southeastern Morocco

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The Late Cretaceous Agoutli locality in southeastern Morocco has yielded a diverse array of marine fishes including †Macrosemia, †Pycnodontidae, †Aspidorhynchidae, †Elasmobranchii, †Chubutichthyidae, †Tresancorhynchidae, †Apichthyoid, and †Pycnosternoididae. Housed in University of Alberta collections from Agoutli are numerous specimens of at least two undescribed amioid fishes. They share derived features with the Amiidae including a rounded or almost rounded caudal fin, having a single or double medial or lateral notch. The length of the fin differs somewhat between the new species. Four subfamilies are currently recognized in Amiidae: †Amiopsinae, †Solenhofenamiasinae, †Vidalamiasinae, and †Amiinae. We recognize two new species, each in a monotypic genus. Compared to representatives of other subfamilies, the new species differ in retaining the more primitive S-shaped as opposed to semicircular posterior border of the caudal fin. The new species differ from each other in the length of the dorsal fin, the number of supraneurals, and the number and posterior extent of the ossified ura central. Preliminary phylogenetic analysis suggests that these Amioid taxa may be related to another amioid genus, †Tomognathus, and that these together should be recognized as a new family that is the sister group of the Amiidae. The †Sinamiidae are the sister group of the new family plus the Amiidae. These new amioids add to the known taxonomic and morphological diversity of earlier marine members of the Amiiformes, a group represented today only by a single North American freshwater species, the Bowfin, Amia calva Linnaeus.

Poster Session IV (Saturday, August 26, 2017, 4:15 – 6:15 PM)

SEABIRDS AS ECOLOGICAL INDICATORS IN LATE CRETACEOUS MARINE ENVIRONMENTS

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In modern marine ecosystems, seabird geographic distribution is correlated with physical, chemical, and biological oceanographic factors. Pursuit diving seabirds – those that actively pursue prey underwater using wing or foot propulsion – are more limited in diverse oceanic and closely tied to other oceanographic factors because diving ability is often gained at the expense of flight capabilities. Today, pursuit diving seabird populations are restricted to waters cooler than 15°C. In contrast, Late Cretaceous marine environments were characterized by greenhouse climate and high sea levels, producing marine ecosystems generally warmer than 15°C. Despite this, Late Cretaceous pursuit diving seabirds called hesperornithiforms are particularly well-represented from North American Western Interior Seaway (WIS) deposits. The contrast in distribution implies that different biotic and abiotic factors may have affected Late Cretaceous epipaleontic ecosystems than what is seen in today’s oceans. Biotic factors like predator-prey relationships and competition are hypothesized to have affected fossil penguin diversity in the Cenozoic, and are also suggested to influence modern pursuit diving seabird distributions. However, the spatio-temporal overlap between hesperornithiforms, such as Thalassodactylus, and modern pursuit diving seabirds does not support the same type of temperature-based competition or predator-prey relationships as the biogeographic driver in the WIS. Rather, it seems that the presence of different apex predators (most notably the lack of marine mammals) may partially account for biotic factors affecting hesperornithiform distribution. Additionally, the shallow depth, abundance of shoreline, and high primary productivity characterizing epipelagic seas are the abiotic factors that likely explain why pursuit diving seabird distribution was so different in the Late Cretaceous compared to today.

Poster Session III (Friday, August 25, 2017, 4:15 – 6:15 PM)

IMPLICATIONS OF AN ANALYSIS OF DEEP PES traces and MANUS IMPRESSIONS FOR THE SUPPOSED ATREIPUS-GRALLATOR ICHNOGENERICPLEXUS: AN APOMORPHY-BASED APPROACH

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The apparent continuum between the Triassic ichnogenus Atreipus and Grallator has been used as a basis for hypothesizing an evolutionary continuum between their track makers. We use an apomorphy-, cladistics-based methodology of track maker identification to test the hypothesis that Grallator and Atreipus are the abiotic factors that likely explain why pursuit diving seabird distribution was so different in the Late Cretaceous compared to today.