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30 Bourque, J., Rincon Burbano, A., Wood, A., Bloch, J., Macfadden, B. NEW TURTLES (REPTILIA, TESTUDINES) FROM THE LAS CASCADAS FORMATION, PANAMA CANAL BASIN, SUGGEST LOW DIVERSITY IN THE EARLY MIOCENE (ARIKAREEAN) NEOTROPICS

31 Awalt, K., Parham, J., Holroyd, P. NEW SPECIMENS OF LEATHERBACK SEA TURTLES (DERMOCHELYIDAE) FROM THE MIocene OF ORANGE COUNTY SHED LIGHT ON MORPHOLOGICAL TRENDS

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in size and shape. Towards the caudal margin, osteoderms are polyhedral, with the central figure occupying up to 70% of the surface and projecting slightly from the peripheral figures. The lateral profile of the postillic region is concave especially near the caudal margin. Other changes of marginal osteoderms are elongated and directed caudally, the central figure occupies over 70% of the surface area, and peripheral figures are almost imperceptible. In succeeding rows of osteoderms, shapes vary from rectangular to trapezoidal, the central figure is progressively reduced, and peripheral figures become more evident. In the lateral cephalic region on both sides of the skull, the osteoderms are strongly convex, the central figure and the peripheral figures are small or imperceptible, and the rear portion is elongated and flat with multiple bony protuberances for insertion of integument; these structures suggest the lateral sides of skull had some mobility that allowed the animals to move the skull during feeding. In males, osteoderms of the dorsal midline at the caudal margin are larger and have a prominent conical boss that diminishes gradually toward the postero-lateral margin. In females the osteoderms of the caudal row are flat and only slightly convex without a prominent boss.

Poster Session IV (Saturday, November 2, 2013, 4:15 - 6:15 PM)

FUNCTIONAL MORPHOLOGY OF THE AZHIDARCHID MANUS

CARROLL, Nathan, Montana State University, Bozeman, MT, United States, 59718

Previous studies of the inferred terrestrial locomotor ability of pterosaurs rely on limb proportions or pedal morphology as the basis for subsequent functional interpretations and often do not consider the morphology of the manual digits. This is especially true for the Azhdarchidae, which are typically represented by fragmented elements and/or obscured preservation of the manus. Three-dimensional preservation of manual elements in an azhdarchid from the Two Medicine Formation of Montana allows for an evaluation of its functional morphology and a comparison to other Late Cretaceous pterosaurs. Phalanges III-1 differs greatly between taxa and is particularly informative for differentiating pterosaur manual morphologies. A principal component analysis of pterosaur proximal phalanges shows that azhdarchids form a cluster separate from other Cretaceous pterosaurs, particularly in the size of the abductor process and the robustness of the proximal phalanges. This unique morphology of phalanges III-1 in azhdarchids is likely a synapomorphy for this group. It is proposed that the greatly expanded proximal portion of phalanx III-1 in azhdarchids is an adaptation to accommodate higher stress loads during quadrupedal walking, and that this phalanx bore the majority of the weight at the metacarpophalangeal joint. This study provides further evidence that azhdarchids were likely proficient walkers and spent a considerable amount of time on the ground.

Poster Session IV (Saturday, November 2, 2013, 4:15 - 6:15 PM)

CHANGES IN DIVERSITY AND STRUCTURE OF THE VALLESIAN (LATE MIOCENE) RODENT RECORD FROM THE VALLES-PENEDÉS BASIN (CATALONIA, SPAIN)

CASANOVAS-VILAR, Isaac, Institut Català de Paleontologia Miquel Crusafont, Cerdanyola del Vallès, Spain; GARCÍA-PAREDES, Israel, Instituto de Geociencias (CATALONIA, SPAIN)

The Vallés-Penedès Basin (Calatonia, Spain) is the type area for the Vallesian stage (early late Miocene; 11.1-8.7 Ma), which is considered an interval of important changes in the European mammal faunas. Several middle Miocene taxa, associated with forested environments, seem to have disappeared in the Vallesian due to an event that caused the “Vallesian Crisis”. Simultaneously, many taxa that later will characterize the rest of the Miocene (Turolian) first occur in Western Europe. We analyze the diversity dynamics and changes in the structure of the Vallesian rodent assemblages from this basin. We have studied over 4000 specimens recovered from 82 different fossil sites. The age of most localities can be accurately estimated using a combination of biostratigraphic and magnetostratigraphic methods. Furthermore, we have considered the biases introduced by the variations in the quality of the record.

Five different local biozones (named V1 to V5) can be recognized on the basis of the rodent content. The rodent fauna of zone V1 is basically identical to that of the late Aragonian (latest middle Miocene), which implies that the dispersal of the equid Hippotherium into the area was not accompanied by any significant environmental change that influenced the rodent fauna. Zones V2 and V3 show a diverse rodent assemblage overwhelmingly dominated by the criketine Cricetulodon, which usually accounts for more than 80 % of the specimens. The boundary between zones V3 and V4 corresponds with the “Vallesian Crisis”. However, the impact of this event on the rodent faunas is found to be less important than previously thought. Several species of sciurids, castoridae, glistidae, eomyids and criketids are said to have disappeared from the area at 9.6 Ma, but our data show that many of them did in fact survive until the end of the Vallesian, being sporadically reoccurring in some sites. Their apparent absence may reflect the fact that the quality of the record is much better during the early (zones V1-V3) than the late Vallesian (zones V4-V5). All the missing species are generally rare in our assemblages, so they require a greater sampling effort to be recognized. It seems likely these species probably occupied very specific habitats that for unknown taphonomic reasons are not recorded during the late Vallesian. Zone V4 also records the dispersal of the first murids (Progonomys). In contrast to what occurred in other Iberian basins, the rodent assemblage continued to be criketine-dominated and murids did not become the dominant rodents until the upper part of zone V5.

Symposium 4 (Saturday, November 2, 2013, 11:00 AM)

VERTEBRATE DIVERSITY AND RESPONSE TO OCEAN TEMPERATURE DECLINE DURING THE LATEST CRETAEOUS IN THE ANTARCTIC PENINSULA

CASE, Judd, Eastern Washington University, Cheney, WA, United States, 99004

The latest Cretaceous marine deposits bearing vertebrate remains from the beginning of the dramatic increase in the end of the Northern Hemisphere, the Ross Island, to the north and southern Seymour Island to the east. Through this approximately 18 million year time span, an 8°C drop in ocean temperature occurs (from 12°C to 4°C) in base ion water in the late Cretaceous. In the Late Crete the vertebrate faunas show a pattern of stable diversity in telost fish, neoselachians and non-avian dinosaurs. Marine reptiles, including plesiosaurs and especially mosasaurs, show a pattern of increasing diversity and abundance through the latest Cretaceous. Thus, the drop in ocean temperature created some taxonomic turnover, but very little effect on overall diversity in the Late Cretaceous. This is especially true for the Azhdarchidae, which are typically represented by fragmentary and often do not consider the morphology of the manual digits. This is

Technical Session VIII (Thursday, October 31, 2013, 2:00 PM)

NEUROANATOMY AND OSSOSO LABYRINTH OF A NEW PERMIAN DICYDONDT FROM MOZAMBIQUE

CASTANHINHA, Rui, Museu da Lourinhã and Instituto Guanabara de Ciências, Lisboa, Portugal; ARAÚJO, Ricardo, Museu da Lourinhã and SMU, Dallas, TX, United States; COSTA JUNIOR, Luis, Museu Nacional de Geologia, Maputo, Mozambique; ANGELICZKYK, Kenneth, Field Museum of Natural History, Chicago, IL, United States; G. MARTINS, Gabriel, Centro de Biologia Ambiental, Faculdade de Ciências, Universidade de Lisboa, Lisboa, Portugal

A nearly complete skull and mandible, with a series of 19 articulated dorsal, sacral and tail vertebrae, ribs, ilia, partial pubis, and ilium (ML1620) was collected from Late Permian Karoo sediments, Metanagual Graben, northern Mozambique (Nâssa Province), Cádiz Formation. The micro-CT 3D visualization of the internal cranial bones, combined with a phylogenetic analysis demonstrates a set of characters shared with Emydopoidea, a restricted clade of small-sized dicynodonts. The brain is narrow and the cerebellum is broader than the forebrain, resembling the condition of other non-mammalian therapsids. The orbits are located far anteriorly relative to the olfactory bulbs. The olfactory bulbs are separated from the cerebral hemispheres by a short olfactory tract. The trigeminal nerve arises near the floculus anteroventrally. The abducens nerve is directed laterally and passes below a notch on the ventral border of the sphenoid bone marking the posterior margin of the basisphenoid. The facial and vestibulocochlear nerves are closely associated and arise behind the semicircular canals. The glossopharyngeal and the vagus accessory nerves exit the hindbrain laterally at nearly mid-height. The hypoglossal nerve pierces the exoccipital, arising from the hindbrain with a medially-oriented orientation. The ancestry of ossos labyrinth, pristinely preserved, shows a bulky vestibule with a lateromedially-oriented canal that links to the fenestra ovalis and then slopes into a strotosseal-orientor portion. The semicircular canals are subequal in diameter. The anterior and posterior superior canals are of equal thickness, while the horizontal canal is broader. The brain of this dicynodont displays a conservative reptilian-grade brain morphology. In fact, the brain morphology here described closely resembles the Dicynodon condition due to the elongated and narrow shape as well as the wide angles between the different brain regions, as opposed to the Lystrosaurus condition.

Technical Session II (Wednesday, October 30, 2013, 9:15 AM)

MESOWEAR AND HYPSODONTY THROUGH TIME IN HYPERTRAGULIDS (ARTIODACTYLA) FROM THE TURTLE COVE MEMBER OF THE JOHN DAY FORMATION OF OREGON

CAVIN, Jennifer, John Day Fossil Beds, Kimberly, OR, United States, 97848; SAMUELS, Joshua, Kimberly, OR, United States

The Turtle Cove member of the John Day Formation includes approximately 400 meters of strata that represent around five million years of deposition. These strata are very well dated, as they are interspersed with six mapped and dated volcanic beds, from about 31 to 26 Ma. Overall, the Turtle Cove member is highly fossiliferous, and by far the most abundant taxa represented are the hypertragulids (mouse deer). Hypertragulids were small, browsing artiodactyls living in a mixed woodland habitat. This habitat gradually became drier and more open through the Oligocene, as evidenced by palaeosol data and the appearance of open habitat specialist taxa. As the habitat changed and after major volcanic events, it would be expected that due to increased ingested grit, the teeth of hypertragulids would exhibit greater wear and selection would favor higher crowned teeth. To examine whether hypertragulids show differences in tooth wear or crown height through time, we measured mesowear and hypsodonty index of lower second molars. Specimens were examined from each stratigraphic unit of the Turtle Cove member, from unit A through unit K2, and an analysis of variance was used to test for