three longitudinal cusp rows. This can be explained by the fact that the lingual row of upper premolar cusps is not involved in attrition in Paulchoffatiidae. The stronger the attrition, the more the direction of the masticatory movements influences the cusp morphology.

Poster Session II, (Monday)

POSTCRANIAL OSTEOLOGY OF *MINMI* SP., A BASAL ANKYLOSAUROMORPH (DINOSAURIA: ORNITHISCHIA) FROM THE EARLY CRETACEOUS (ALBIAN) ALLARU MUDSTONE OF QUEENSLAND, AUSTRALIA

LEAHEY, Lucy, School of Biological Sciences, The University of Queensland, Brisbane, Australia; MOLNAR, Ralph, Museum of Northern Arizona, Flagstaff, AZ, USA; SALISBURY, Steven, School of Biological Sciences, The University of Queensland and Section of Vertebrate Paleontology, Carnegie Museum of Natural History, Brisbane and Pittsburgh, Australia

Minmi is the only known genus of ankylosauromorph from Australia. Seven specimens are known from the Early Cretaceous of Queensland. However, only two of these specimens have been described in any detail: the holotype *Minmi paravertebra* from Roma and a nearly complete skeleton preliminarily referred to as *Minmi* sp. from Marathon Station near Richmond. The Marathon specimen represents one of the world's most complete Early Cretaceous ankylosauromorphs and is the best-preserved dinosaur fossil of any age from East Gondwana. The majority of ankylosaurs have been found in Late Cretaceous sediments of Laurasian continents and thus the evolution of this group during that time and in this part of the world is well understood. Conversely, very little is known about ankylosaurs in the early stages of their evolutionary history (Jurassic-Early Cretaceous) and in the Gondwanan landmasses, due in part to the rarity and fragmentary nature of most known specimens. *Minmi* sp., with its Early Cretaceous age and unique state of preservation, is an ideal taxon with which to examine the early evolution of this distinct dinosaurian fauna.Previous work on the cranial osteology of *Minmi* revealed that the taxon is positioned basal to the traditional Ankylosauria (Ankylosauridae + Nodosauridae), but higher than Thyreophora. Phylogenetic analysis incorporating cranial data strongly supported the creation of the stem-based Ankylosauromorpha, which includes all eurypods closer to *Ankylosaurus* than *Stegosaurus*. The description of the postcranium of *Minmi* sp. has resulted in the reassessment of some previous characters and the formation of new ones relating to the phylogenetic relationships of Ankylosauromorpha. Preliminary results reaffirm *Minmi*'s basal position within Ankylosauromorpha. *Minmi* shows that basal ankylosauromorphs were similar to *Scelidosaurus*, in that they were proportionally smaller and less robust, with a less well-developed dermal skeleton than ankylosaurians.

Poster Session III, (Tuesday)

THE AXIAL SKELETON OF *GRACILISUCHUS STIPANICICORUM*: AUTAPOMORPHIC CHARACTERS AND ITS PHYLOGENETIC INFORMATION WITHIN THE CONTEXT OF CRUROTARSI

LECUONA, Agustina, Museo Paleontológico Egidio Feruglio (MEF), Trelew, Argentina

Gracilisuchus stipanicicorum is a small suchian archosaur from the Middle Triassic Chañares Formation (NW Argentina), known from well preserved specimens but poorly studied anatomically. Since its description it has been related to different lineages of Archosauria and recently considered closely related to Crocodylomorpha, although a consensus is lacking about its relationships within Crurotarsi. The present study was performed on the basis of the axial skeleton of the holotype (PULR 08) and one referred specimen (PVL 4597). As a result of this study a unique combination of characteristics present in the axial skeleton of *Gracilisuchus* is identified (autapomorphies marked with a *): an horizontal postzygapophysial facet of the axis, posteriorly directed, and facing ventrally*; a high and vertical anterior border of the axial neural spine*; a concavoconvex posterior articular surface of the cervical vertebrae*; cervical vertebrae with a circular depression on the mid-dorsal region of the neural arch; absence of spine table in posterior dorsal vertebrae; two paramedian osteoderms per vertebra. Several axial characters support a relationship with Crocoylomorpha, such as the presence of a presacral vertebral count of at least 24, similar to some basal crocodylomorphs and crocodyliforms. A derived character state shared with the crocodylomorph *Hesperosuchus* is the presence of poorly developed ventral keels in the postaxial cervical vertebrae. Probable plesiomorphic features are the absence of a developed postzygapophysial process in the axis, shared with basal archosauriforms and *Parasuchus*; the presence of a ventral keel in the axis, shared with members of the archosauriform clade, whereas the absence of such a keel is found in some basal crocodyliformes (*Sphenosuchus*, *Junggarsuchus*). This information is added to a cladistic analysis within the context of Archosauriformes to test its phylogenetic affinities with the addition of the new information of the axial skeleton.

Technical Session I, Sunday 8:00

THE UNIVERSAL TEMPERATURE DEPENDENCE MODEL FAILS TO PREDICT BODY TEMPERATURES ACCURATELY FOR EXTANT AMNIOTES AND EXTINCT DINOSAURS

LEE, Andrew, Ohio University, Athens, OH, USA; IRMIS, Randall, Utah Museum of Natural History and University of Utah, Salt Lake City, UT, USA; WEDEL, Mathew, Western University of Health Science, Pomona, CA, USA; WERNING, Sarah, Univ. of California Museum of Paleontology and Univ. of California, Berkeley, Berkeley, CA, USA; PADIAN, Kevin, Univ. of California Museum of Paleontology and Univ. of California, Berkeley, Berkeley, CA, USA

The Universal Temperature Dependence (UTD) model, which relates growth rate to body temperature, purported to solve the question of non-avian dinosaur thermophysiology by demonstrating a pattern of increasing body temperature with size across several species. These data suggested that dinosaurs were ectothermic poikilotherms and that only the largest ones could use their mass to attain homeothermy. We first tested that model on living animals, using data from 302 species of lepidosaurs, turtles, crocodylians, birds, and mammals. We found that across this broad range of amniotes, the scaling trends of the actual data do not consistently match those predicted by the UTD model: there are significant prediction errors for 44% of extant non-avian reptiles and birds, and 67% of extant mammals. We also found that resting body temperature is independent of size in non-avian reptiles, birds, and mammals, regardless of their thermoregulatory strategies. Then, using recently revised estimates of non-avian dinosaur growth rates based on skeletochronologic data, we found that predicted body temperature was also size-independent for these taxa. This refutes the claim based on the UTD model that dinosaurs could attain homeothermy only by growing to large size. In contrast, the independence of size and body temperature in dinosaurs is consistent with published data on oxygen isotope fractionation and bone histology, together implying relatively tachymetabolic and endothermic homeothermy. The UTD model is insufficient to predict body temperatures and thermometabolic strategies for individual species and clades, either living or extinct. However, its results for non-avian dinosaurs are broadly consistent with other evidence that dinosaurs were tachymetabolic, endothermic homeotherms.

Poster Session II, (Monday)

THE FIRST CERATOPSIAN FROM KOREA

LEE, Yuong-Nam, Korea Institute of Geoscience and Mineral Resources, Daejeon, Korea, South; RYAN, Michael, Cleveland Museum of Natural History, Cleveland, OH, USA; KOBAYASHI, Yoshitsugu, Hokkaido University Museum, Hokkaido, Japan

In 2008, a new basal neoceratopsian was discovered in the Tando Formation (Cenomanian~Turonian) of Tando Basin in Korea. It represents the first ceratopsian dinosaur in the Korean peninsula and is an important datum for the paleogeographic distribution of ceratopsians. It represents the easternmost occurrence of basal neoceratopsians in Eurasia and comes from a time period with a very limited fossil record for the group. Autapomorphies of the new taxon include: very tall neural spines over 5 times as high as the vertebral centrum in the distal caudals, and a unique astragalus divided into two fossae by a prominent craniocaudal ridge on the proximal surface. A phylogenetic analysis indicates that the new taxon is more derived than *Archaeoceratops* and is the sister group to Leptoceratopsidae+ *Graciliceratops* and all more derived ceratopsians, and that the elongation of caudal neural spines is an important derived character in non-ceratopsid neoceratopsians. The very tall caudal neural spines of the new taxon, *Montanoceratops*, *Udanoceratops*, *Protoceratops*, and *Bagaceratops* appear to be homoplasious, suggesting an independently acquired adaptation that may be related to swimming. Skeletal evidence suggests that obligate quadrupedalism occurred gradually in neoceratopsians progressing from bipedal through facultative quadrupedalism, to complete quadrupedalism in Coronosauria with a progressive increase in body size and robustness, and a modification of unguals from claws to hoofs.

Poster Session IV, (Wednesday)

AVIAN EGGSHELL FRAGMENTS FROM A FRESHWATER FACIES OF THE SALINE WILKINS PEAK MEMBER OF THE EOCENE GREEN RIVER FORMATION

LEGGITT, V. Leroy, Department of Earth and Biological Sciences, Loma Linda University, Loma Linda, CA, USA

Abundant avian eggshell fragments occur in a nearshore freshwater facies of the saline Wilkins Peak Member of the Green River Formation near the northwestern edge of Eocene Lake Gosiute. The eggshell fragments are associated with *Preshyornis* (Aves: Anseriformes) bones and occur in multiple stratigraphic intervals between the layered tuff (a well known Wilkins Peak marker bed) and the base of the Laney Member of the Green River Formation. The eggshell fragments are associated with ostracods, caddisfly larval cases, microbialites and intraclast micrite (both calcimicrite and dolomicrite). Mudcracks are common on the surface of the intraclast dolomicrite that contains the greatest concentration of eggshell fragments.

Several eggshell fragments were studied by light microscopy (LM), by polarized light microscopy (PLM) and by scanning electron microscopy (SEM). The resultant micrographs were compared with published reports of modern and fossil "ornithoid", "crocodiloid", "testudoid" and "geckoid" eggshell. The Wilkins Peak eggshell fragments show the following microstructure zones (from internal to external): 1) an organic core, 2) a zone of radial calcite plates, 3) a zone of tabular crystallite plates, 4) a zone of squamatic aggregates and 5) an external zone of vertical calcite crystals. Macrostructure zones (from internal to external) are: 1) wedges of the mamillary layer (diverging outward from the central core), grading into 2) long vertical columns of the prismatic layer. These findings are similar to the characteristics of modern neognathous eggshell.

The abundant avian eggshell fragments and the avian bones support a nesting site hypothesis for this study site. The caddisfly larval cases, microbialites, mudcracks, intraclast micricites and avian eggshell fragments are strong evidence for a lake margin depositional environment. The absence of oil shale and evaporite facies normally associated with the Wikins Peak Member of the Green River Formation indicates that this study site was close to a freshwater source (river or spring). It is likely that the birds that produced the eggshell preferred nesting sites close to freshwater sources.