MEETING PROGRAM AND ABSTRACTS

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such *Dicothodon bajaensis* with *Adamisaurus magnidentatus* from Mongolia, would be strengthened with the identification of the scincid.
Grant Information
PAPIIT: IN104506-2, IN 111209, IN 100913, IN 103616

Poster Session II (Thursday, October 18, 2018, 4:15 – 6:15 PM)

GEOMETRIC MORPHOMETRIC ANALYSIS OF THE MANUS AMONG MESOZOIC MAMMALS AND ITS IMPLICATION FOR THEIR FEEDING ECOLOGY

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Over the last two-decades discoveries of Mesozoic mammal fossils around the world have reshaped the fundamental understanding of the evolutionary history of those now-extinct species. Recent studies on well-preserved skeletal remains, using both qualitative and quantitative approaches, have suggested that extinct mammals had a great ecological diversity in Mesozoic terrestrial ecosystems. Their locomotor diversity could be compared to that of extant small-bodied species. The diverse manual morphologies played an important role in assisting Mesozoic species to adopt diverse locomotor modes and to occupy different ecological niches. However, the manus also plays an important role in feeding ecology among extant mammals, which was largely ignored in previous studies on Mesozoic mammals. To investigate the function role of the manus in feeding ecology among Mesozoic mammals, we conducted a geometric morphometric analysis of the manus of 58 extant small-bodied mammals of 12 orders, including Afrosoricida, Carnivora, Didelphimorphia, Dasyuromorphia, Diprotodontia, Erinaceomorpha, Monotremata, Peramelemorphia, Primates, Rodentia, Scandentia, and Soricomorpha. We categorized their dietary preference into carnivore, frugivore, omnivore, granivore, herbivore, and insectivore. We digitized 71 landmarks of the manus to outline its general shape in dorsal view and performed Generalized Procrustes Analysis (GPA) and Principal Component Analysis (PCA) on the dataset. Our preliminary results indicate that extant frugivore and herbivore (root-tuber feeding) species have distinct manual morphologies from the rest of the others, whereas extant carnivore, omnivore, and insectivore species show indistinct morphologies. Most of our inferred dietary preferences of Mesozoic mammals were consistent with the inferences of previous studies. However, the eutriconodontan species exhibit some morphological features in the manus that are similar to some extant herbivore species.

Poster Session III (Friday, October 19, 2018, 4:15–6:15 PM)

SHINING A LIGHT ON NIGHTBIRD RELATIONSHIPS: A TOTAL-EVIDENCE PHYLOGENY OF STRISORES

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Strisores is a clade of mostly insectivorous crown-group birds that includes highly specialized fliers such as the Apodiformes (swifts and hummingbirds), as well as the nocturnal Caprimulgidae (nightjars), Steatornithidae (oilbird), Nyctibiidae (potoos), Podargidae (frogmouths), and Aegothelidae (owlet-nightjars). Recent molecular and morphological phylogenetic analyses have uniformly recovered the nocturnal strisorians as a paraphyletic grade with respect to Apodiformes. However, despite the use of large- scale molecular datasets, the precise phylogenetic relationships between the nocturnal strisorians have been resolved inconsistently by different studies and remain controversial. Given the lack of consensus between results based on molecular data, we examined the possibility that incorporating morphological data from fossils might improve resolution of this phylogenetic problem. Putative stem-members of nearly all major strisorian lineages have been described from Eocene fossil deposits, potentially providing critical information on ancestral character states within Strisores. We adopted a total-evidence approach combining both molecular and morphological data, which has hitherto only been applied to strisorian phylogeny to a limited extent. Our phylogenetic dataset includes 117 morphological characters scored for 24 strisorian taxa (of which 14 were fossil taxa) as well as DNA sequences from the extant taxa. This dataset was analyzed using Bayesian phylogenetic methods in MrBayes, resulting in a novel phylogenetic topology of Strisores that is nonetheless largely congruent with the findings of a comprehensive recent molecular phylogenetic analysis of modern birds.

In future work, we aim to further clarify the early evolution of Strisores by performing a tip-dating analysis on our dataset to generate a time-calibrated phylogeny of these specialized birds.

Poster Session III (Friday, October 19, 2018, 4:15–6:15 PM)

HIND LIMB MORPHOLOGY OF PALEOGENE MICROMOMYID PLESIADAPIFORMS (EUARCHONTA, PRIMATES)

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Micromomyid plesiadapiforms are small euarchontan mammals known from the late Paleocene and early Eocene of western North America. Recent phylogenetic analyses support micromomyids as the most basal stem primates known from partial skeletons. We analyzed the hind limb of all of these skeletons (*Tinimomys graybulliensis*, n = 3; *Dryomomys szalayi*, n = 1). Micromomyids had a mobile hip joint with a craniocaudally elongated acetabulum and spherical femoral head that is slightly higher than the greater trochanter. The acetabulum is cranially buttressed with an expanded articular surface for incurring loads when using orthograde postures on vertical supports. Micromomyids lacked the hind limb features of specialized leapers and runners for powerful extension of the knee, and instead have a small anterior inferior iliac spine, dorsoventrally shallow distal femur, and short patellar groove indicating a habitually flexed knee. These hind limb features are similar to those of other plesiadapiforms, butsmicromomyids differ in having a relatively longer crus. Their fibula is unique among plesiadapiforms in having a dorsoventrally expanded proximal end for the origin of flexor fibularis and peroneus longus. This corresponds with the large, wide groove on the astragalus for the tendon of flexor fibularis, which aids in pedal plantarflexion, digital flexion, and pedal grasping. The entocuneiform-1st metatarsal joint suggests a divergent hallux capable of non-opposable pedal grasping, and the long volar processes on the distal phalanges suggest long apical pads for grasping. Overall, the hind limbs of *T. graybulliensis* and *D. szalayi* are similar and support the hypot hesis that they were non-leaping arborealists capable of pedal grasping like that of the extant treeshrew *Ptilocercus lowii*. Though these species are relatively derived and recent within Micromomyidae, their shared features likely characterize the clade at least back to the divergence of *Tinimomys* and *Dryomomys* in the late Tiffanian North American Land Mammal Age (NALMA). Furthermore, micromomyid astragali and calcanei are uniquely similar to those attributed to *Purgatorius*, the oldest and most basal known plesiadapiform from the Puercan NALMA, which suggests that certain micromomyid hind limb features also characterize the ancestral primate. As early Paleocene plesiadapiform postcrania remain elusive, the fairly basal position and well-preserved skeletons of micromomyids make them critically important for understanding early locomotor and postcranial evolution in primates.

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Poster Session III (Friday, October 19, 2018, 4:15–6:15 PM)

A REMARKABLE ASSEMBLAGE OF ENANTIORNITHINE BIRDS FROM THE LATE CRETACEOUS OF SOUTHEASTERN BRAZIL

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Despite abundant discoveries of Mesozoic birds in recent decades, knowledge of their evolution during the last 20 million years of the Cretaceous remains scant. However, this time interval is essential to better understand the rise of modern birds and the pattern of avifaunal turnover during the Cretaceous-Paleogene transition. We report on a remarkably rich site (William's Quarry; discovered in 2004 by WN) contained in the Upper Cretaceous Adamantina Formation (Bauru Group) of southeastern Brazil (Presidente Prudente, western São Paulo State). Excavations at this site have produced hundreds of isolated and partially articulated remains of small to medium-sized enantiornithine birds concentrated in a very small area (approximately 6 m^2) of red-pink fluvial sandstones and claystones. Representing at least three taxa, the remains include numerous postcranial elements as well as many skull portions (isolated rostra, mandibles, and crania) preserved in three dimensions. As the most abundant avian Mesozoic locality in the Americas and the richest site of Late Cretaceous age in the world, this site provides key information for contrasting hypotheses of avian diversification during the K-Pg transition and the earliest divergences of modern birds. Along with other Late Cretaceous localities from Gondwana, the information revealed at this site indicates a clear abundance of enantiornithine bird species during the ~80–70 mya interval. Such a record is difficult to reconcile with hypotheses arguing that modern (neornithine) birds originated in the southern hemisphere during the Late Cretaceous.

Technical Session IV (Wednesday, October 17, 2018, 2:45 PM)

ECOLOGICAL NICHE MODELLING SUPPORTS SUSTAINED DINOSAUR DIVERSITY TRENDS PRIOR TO THE CRETACEOUS/PALEOGENE MASS EXTINCTION

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Dinosaur diversity in the lead-up to the Cretaceous/Paleogene mass extinction (66 million years ago) remains a topic of heated debate. Whereas some authors argue that dinosaurs were already in long-term decline, others contend that they were thriving until their sudden demise. The latest Cretaceous (Campanian–Maastrichtian) of North America provides the best paleontological record to address this debate, but even here diversity reconstructions are biased by uneven sampling. Subsampling and other methods are heavily constrained by their inability to deal with the absence of data, especially when the spatial distribution of the fossil record is strongly heterogeneous. Ecological niche modelling, using species occurrences and climatic data to reconstruct habitat distribution, offers a possible solution for interpolating biogeographic patterns despite fragmentary information, enabling the integration of models of distributional patterns from unsampled areas. We combined fossil occurrence data with HadCM3L paleoclimatic simulations to define latest Cretaceous North American dinosaur habitat availability. A time series analysis of species distribution models was developed from the early Campanian to the late Maastrichtian. The ecological niches modeled on available outcrop area through time show a decline in habitability for major non-avian dinosaur clades, an outcome mirroring results based on previous analyses of diversity and morphological disparity. However, when a continental projection is considered, the pattern shifts dramatically, showing an overall increase in niche suitability from the Campanian to the Maastrichtian instead, although niche evolution between stages was minimal. Combining digital elevation models of the latest Cretaceous of North America with results from our climate model, we created virtual taphofacies (using physical parameters such as sediment flux and surface runoff), identifying areas suitable for potential dinosaur fossil preservation. The combination of these approaches demonstrates how dinosaur habitat increased spatially as a result of the Sevier-Laramide orogeny and the forced regression of the Western Interior Seaway in the Maastrichtian. However, these same agents limited areas of high taphonomic suitability in the final stage of the Cretaceous. These results hint at a hidden diversity of dinosaurs in the Maastrichtian