cancellous bone in a fan-like shape, emerging from the medullary cavity at the center of the specimen. The cancellous bone is surrounded by denser compact bone, in turn displaying a series of at least 10 lines of arrested growth (LAGs).

Vascular canals are traceable throughout the cancellous bone, with a few large vessels at the center, branching into a multitude of smaller vessels at both the proximal and distal ends of the propodial. Our 3D model of the vascular canals provides a detailed overview of the nutrient distribution network, giving insight into the pattern of bone growth.

We found that the method is valuable for highlighting features such as LAGs in compact bone, the contacts between compact and cancellous bone, and the network of vascular canals, while avoiding destructive sectioning of the sample. Use of this methodology is recommended as an alternative for exploring bone histology of fossil specimens where the integrity of the sample needs to be preserved.

Funding Sources The 4D Imaging Lab, Lund University provided access to the X-ray tomograph (RX Solutions). Natural History Museum in Stockholm provided access to the specimen (R2008).

Regular Poster Session 2 (Thursday, October 19, 2023, 4:30 - 6:30 PM)

ACTINOPTERYGIAN FISH ASSEMBLAGE FROM THE UPPER CRETACEOUS (CAMPANIAN-MAASTRICHTIAN) DUWI FORMATION, WESTERN DESERT, EGYPT

El-Sayed, Sanaa[1], Friedman, Matt[2], O'Connor, Patrick M.[3], Sertich, Joseph J.[4], Sieffert, Erik[5], Salem, Belal S.[1], Sallam, Hesham M.[1]

[1]Mansoura University Vertebrate Paleontology Center, Department of Geology, Faculty of Science, Mansoura University, [2]Museum of Paleontology and, Department of Earth and Environmental Sciences, University of Michigan, Ann Abor, Michigan, United States, [3]Department of Biomedical Sciences, Ohio University Heritage College of Osteopathic Medicine and, Ohio Center for Ecological and Evolutionary Studies, Ohio university, Athens, Ohio, United States, [4]Smithsonian Tropical Research Institute, Panama City, Panamá [5]Department of Integrative Anatomical Sciences, Keck School of Medicine of USC, University of Southern California, Los Angeles, California, United States,

Late Cretaceous (Campanian-Maastrichtian) marine actinopterygians from the southern Tethys platform are underreported and understudied in comparison to chondrichthyans from this region. Exposures of the Duwi Formation near the Dakhla, Kharga and Baris oases preserve a diverse assortment of actinopterygian fishes not previously reported from this unit. Horizons yielding fossils represent shallow marine deposits of upper Campanian-lower Maastrichtian age. The actinopterygian assemblage includes representatives of several groups of large-bodied, predatory fishes, all of which belong to the teleost total group: †Pachycormiformes (†Pachycormidae), †Pachyrhizodontiformes (†Pachyrhizodontidae), †Ichthyodectiformes (†Saurodontidae), and Aulopiformes (†Enchodontidae, † Dercetidae and †Cimolichthyidae). The presence of saurodontids in the Duwi Formation is noteworthy as the first confidently identified fossils for this group from Africa. Specimens are based on and diagnosed from isolated and fragmentary elements, implying significant disarticulation prior to burial. Palaeobiogeographically, actinopterygians of the Duwi Formation show compositional similarity with assemblages from the Northern Tethys Platform and the Western Interior Seaway of North America, consistent with mounting evidence for communication across the Tethys Ocean. Additional exploration of the uppermost Cretaceous units in southern Egypt promises potential for the discovery of important fossils to better characterize the composition and paleogeographic distribution of the latest Cretaceous ichthyofauna of the Tethys region.

Funding Sources Mansoura University, American University in Cairo, Science and Technology Development Fund (STDF) and National Geographic Society/Waitt Foundation (W88-10).

Technical Session 5: Ungulates (Wednesday, October 18, 2023, 1:45 PM)

NO SUPPORT FOR AN INTERCHANGE-DRIVEN EXTINCTION OF NOTOUNGULATES AND LITOPTERNS BASED ON DIVERSIFICATION RATES OF SOUTH AMERICAN NATIVE UNGULATES (SANUS)

Engelman, Russell[1], Beck, Robin M.[2], Potts, Phoebe[2], Croft, Darin A.[3]

[1]Department of Biology, Case Western Reserve University, Cleveland, Ohio, United States, [2]School of Science, Engineering and Environment, University of Salford, Salford, United Kingdom, [3]Department of Anatomy, Case Western Reserve University, Cleveland, Ohio, United States

South American native ungulates (SANUs) comprise a highly diverse, possibly monophyletic assemblage of mammals, with five currently recognized orders (Notoungulata, Litopterna, Astrapotheria, Pyrotheria, and Xenungulata). This group has a long (~65 Ma) evolutionary history but went extinct relatively recently, with the last species surviving until ~12 ka. The decline and extinction of SANUs has often been attributed to competition from Holarctic ungulates during the Great American Biotic Interchange (GABI), but this hypothesis has never been tested quantitatively. Here, we use lineage-through-time analyses of a new dated supertree phylogeny including more than 300 SANU species to track diversification patterns of this group throughout the Cenozoic. We identify three major events in SANU evolutionary history: (1) an "explosive" diversification in the early Eocene (60–50 Ma); (2) a major turnover at the Eocene–Oligocene boundary (~35 Ma); and (3) a protracted decline beginning in the late middle/early late Miocene (12–10 Ma) and persisting until the extinction of the group. The decline of SANUs significantly predates the earliest stages of the GABI and is seemingly unaffected by the large-scale immigration of northern ungulates circa 3.5 Ma. Instead, the decline of SANUs seems to coincide with the diversification of large, folivorous caviomorph rodents (Cavioidea and Chinchilloidea) and xenarthrans (Pilosa and Glyptodontoidea) during the late middle to early late Miocene. This pattern resembles the turnover between browsing and grazing ungulates on northern continents associated with the expansion of C_4 grasslands during the same timeframe, albeit with hypselodont SANU lineages like notoungulates in the role of browsers (agreeing with previous suggestions these animals were not grazing specialists). This suggests the expansion of open habitats may have been an abiotic driver of passive replacement between ungulate and non-ungulate herbivores in late Cenozoic South America. This turnover in the herbivore guild coincides with similar turnovers in the South American metatherian fauna (e.g., the decline of paucituberculatans/sparassodonts and the radiation of didelphids), suggesting a possible large-scale faunal turnover in South American terrestrial ecosystems 12–10 Ma.

Regular Poster Session 2 (Thursday, October 19, 2023, 4:30 - 6:30 PM)

THE EVOLUTION OF THE PINNIPED (MAMMALIA, CARNIVORA, PINNIPEDIA) BACKBONE

Esteban, Juan Miguel, Martin-Serra, Alberto, Perez Ramos, Alejandro, Pérez-Claros, Juan A., Figueirido, Borja

Ecology and Geology, Universidad de Málaga, Málaga, Málaga, Spain

Here, we explore vertebral disparity, morphological integration and its relationship with locomotor adaptations in the presacral vertebrae of a set of living and extinct pinnipeds (Carnivora, Pinnipedia). The results obtained show that vertebral morphological disparity is higher in phocids than in otariids. In addition, disparity through time analyses indicate that, for most vertebrae, otariid subclades tend to explore different regions of the morphospace, whereas phocid lineages overlap within similar regions. Finally, the study of integration between vertebrae in otariids reveals an absence of a modular pattern along the spine, in contrast to a slightly modular pattern found in phocids. These results suggest that adaptation to the aquatic environment in both groups follows two completely different pathways, probably associated with their mode of aquatic locomotion. Moreover, functional analyses based on joint mobility indicate a significant association between the patterns of disparity and integration and locomotor performance in the pinniped vertebral column.

Funding Sources Spanish Ministry of Science and Universities (PID2019-111185GB-I00).

Regular Poster Session 4 (Saturday, October 21, 2023, 4:30 - 6:30 PM)

A GIGANTIC HADROSAURID SPECIMEN FROM THE UPPERMOST CRETACEOUS HELL CREEK FORMATION OF MONTANA WITH IMPLICATIONS FOR DINOSAUR DIVERSITY