initial segmentation, followed by quality control and data organization prior to study. As a result of preparation, associations of elements from individuals were demonstrable taphonomically (e.g., by connecting fragments of sternum prepared digitally and prototyped for confirmation of fits along pre-depositional breaks) and anatomically (by close physical association of non-overlapping elements, many of which were not visible on the mechanically prepared surface). We created high-resolution taphonomic digital reconstructions of materials across largely unprepared blocks of matrix. The two preparation approaches resulted in the defensible organization of discrete, dispersed anatomical elements into the context of individuals whose anatomy, functional morphology, and phylogenetic relationships can be studied. We also produced prototype outputs of morphology that could not be replicated through molding and casting, resulting in 3D models for primary research and comparative work, as well as for dissemination and exhibition activities.

Grant Information:
National Science Foundation (EAR_1525915)

Regular Poster Session II (Thursday, October 10, 2019, 4:15 - 6:15 PM)

NEW LISSAMPHIBIAN MATERIAL FROM THE LOURINHÃ FORMATION (LATE JURASSIC, PORTUGAL)

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The Upper Jurassic of Portugal has been known for its vertebrate microfossil fauna thanks to the Konzentrat-Lagerstätte of the Guimarota mine, which provided thousands of bone fragments from various vertebrate clades. Hereby are reported three new vertebrate microfossil assemblages from the Lourinhã Formation: Porto das Barcas and Zimbral, from the Praia Azul Member, and Valmitão, from the Porto Novo / Praia da Amoreira Members. All the localities are late Kimmeridgian in age. The assemblages have provided over one thousand vertebrate microfossils, including chondrichthyans, actinopterygians, lissamphibians, squamates, dinosaurs, pterosaurs and crocodylomorphs. All materials are housed at the Museu da Lourinhã collection. Paleoenvironmental reconstructions suggest Porto das Barcas and Zimbral were floodplain mud deposits, and Valmitão was an oxbow lake mud deposit. Nevertheless, the presence of marine bivalve shells suggests at least some brackish influence.

The Lissamphibia remains are one the three most abundant microfossils in the assemblages, after crocodylomorphs and fishes, for which teeth and scales overestimate their real presence. The new material here reported includes over 50 cranial and post-cranial remains belonging to Albanerpetontidae and Anura. Albanerpetontid material comprises fragmented cranial material, including a dozen of dentaries with tricuspid teeth and one fused frontal, thirty hour-glass shaped vertebra centra, and fragmented limb bones, including two pentagonal-shaped proximal humeri and six femora (three proximal parts and three distal parts). Anuran material is scarcer, including a distal part of a humerus with a complex ulnar condyle and an extended olecranon scar, and a tibiofibular They represent the first report of anurans in the Late Jurassic of Portugal outside the Guimarota Mine. Other remains have been attributed to undetermined lissamphibians, including an atlas and a scapula.

The faunal association suggests that all three localities were continental ecosystems with lacustrine influence, dominated by terrestrial and amphibious taxa. Amphibians are indubitable indicators for freshwater environments and their occurrence in the three assemblages strongly support their interpretations as terrestrial ecosystems. It is congruent with previous stratigraphic and sedimentological interpretations on these units.

Grant Information:
Supported by Microsaurus-superanimais 3 research grant funded by PDL; SFRH / BPD / 113130 / 2015 funded by the FCT-MCTES of Portugal; and project PTDC / CTA-PAL / 31656 / 2017 of FCT

Regular Poster Session IV (Saturday, October 12, 2019, 4:15 - 6:15 PM)

PHYLOGENY OF SOUTH AMERICAN MARSUPIAL *DROMICIOPS* THROUGH BRAIN TRAITS

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Dromiciops gliroides "monito del monte" is an extant small and mostly arboreal, nocturnal South American marsupial, and is the only living species belonging to the Order Microbiotheria. The oldest known microbiotherian is from the Early Paleocene of Bolivia, other fossil genera have been discovered in the Paleogene and Neogene of South America and the Middle Eocene of Antarctica.

Dromiciops lives in the temperate Valdivian *Nothofagus*-*Chusquea* forests of southern Chile and adjacent areas in western Argentina. Phylogenetically this south American marsupial is more closely related to Australasian rather than American marsupials.

Here we have analyzed the internal brain anatomy of *Dromiciops gliroides* and compared it with the brains of extant American and Australian marsupials. We examined phylogenetic relationships of *Dromiciops* with extant marsupials based on maximum parsimony analysis using a soft body brain morphology-only matrix, using 21 soft anatomy brain characters and 96 mammalian taxa (93 marsupials, 2 monotremes, and one placental). Six extra soft anatomy brain characters were added to those used by Johnson and co-workers.

Dromiciops does not have a fasciculus aberrans, but does exhibit other features of brain structure that are similar to diprotodontid metatherians (e.g., lamination of the lateral geniculate nucleus of the dorsal thalamus). Cortical organization in *Dromiciops* shows some similarities with that in Australian marsupial carnivores in that the proportional areas of isocortex devoted to somatosensory and visual function are similar in size to each other, and greater in area than that devoted to olfactory or auditory function. This points to similar sensory requirements for the foraging lifestyle of *Dromiciops* and small Australian marsupial carnivores, with isocortical specialization for somatosensation and vision. The results using brain anatomy characters place *Dromiciops* nested within the Australasian marsupial radiation (i.e., within Australidelphia) and recovered *Dromiciops* as a sister group to the Australasian marsupial clade Diprotodontia.

Regular Poster Session I (Wednesday, October 9, 2019, 4:15 - 6:15 PM)

PALEOPATHOLOGY IN NEW MATERIALS OF *MAJUNGASAURUS CRENATISSIMUS* FROM THE MAEVARANO FORMATION, NORTHWESTERN MADAGASCAR

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Due to the nature of the vertebrate fossil record, it is rare that an extinct species is represented by more than a few elements, let alone multiple relatively complete individuals. Field research conducted in the Upper Cretaceous (Maastrichtian) Maevarano Formation in northwestern Madagascar over the past 14 years has yielded several new partial individual skeletons of the abelisaurid theropod *Majungasaurus crenatissimus*. The number of individuals and quality of preservation, although variable, allows for assessment of pathology in this species. Previous pathologies documented in *Majungasaurus* indicate select infectious (i.e., microbial) and possible traumatic etiologies. Continuing fieldwork and ongoing preparation of materials recovered since 2005 provide many additional opportunities to better characterize the anatomy and paleopathology in *Majungasaurus*. In particular, an almost complete articulated skeleton (FMNH PR 2836) is the focal point of the current study, with selected observations from other new specimens. FMNH PR 2836 preserves multiple osteopathologies, including representative lateral facial and lower jaw elements, vertebrae, ribs and gastralia. A diagnosis with hypothesis of pathological origin is provided for each skeletal entity. The preserved pathologies include necrotic bone infection of the jugal and quadratojugal, healed fractures of several left and right dorsal ribs and gastralia, and a cervical vertebra (C5) with evidence of a healed tooth drag injury on the lateral surface of the neural arch. Putative infections present in the jugal and quadratojugal appear relatively minor, with only small areas affected and the erosions penetrating only the medial surface of each element with some evidence of healing. Given the proximity of the two elements, it is likely that a localized infection affected both bones. The dorsal rib fractures are present bilaterally, occurring sporadically throughout the series, with varying degrees of healing and at different dorsoventral positions. Given both spatial and remodeling variability of the injuries, it is likely that they are the result of multiple interactions with other organisms or the environment. Lastly, a putative drag mark on the fifth cervical vertebra does not show any sign of healing and is likely the result of a post-mortem scavenging. Since osteological pathologies record aspects of life history, observations from this study can provide insight into the physiology, behavior and, potentially, the nature of the environment experienced by *Majungasaurus*.

Grant Information:
National Science Foundation EAR_1525915