



# 83RD ANNUAL MEETING

## SVP 2023 PROGRAM GUIDE

Duke Energy Convention Center | Cincinnati, Ohio USA  
October 18 – 21, 2023



is unlike *Syncerus* spp. Whether a new species or an extremely large individual of a different known taxon, it is clear that at least two giant bovids were present in the CHK. Finding different types of giant bovids at the same site is extremely rare. Giant bovids are typically associated with open habitats and extreme hypsodonty is usually associated with grazing behaviors. The giant bovids indicate that at least some of the ecotones in the CHK were relatively open habitats.

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Technical Session 17: Afrotheria & Mammal Macroevolution (Saturday, October 21, 2023, 8:00 AM)

#### **SMALL MAMMALS IN A LARGE TREE: EXAMINING THE TIMING OF THE EARLY THERIAN RADIATION USING A NOVEL PHYLOGENETIC METATREE**

Grossnickle, David<sup>1</sup>, Hellert, Spencer<sup>2</sup>, Ely, Ricardo<sup>3</sup>, Slater, Graham<sup>4</sup>, Lloyd, Graeme<sup>5</sup>, Angielczyk, Kenneth D.<sup>6</sup>, Bormet, Allison<sup>1</sup>, Wilson Mantilla, Gregory<sup>7</sup>

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Mammals achieved considerably greater ecological diversity in the Cenozoic compared to the Mesozoic. However, there remains uncertainty about the origins of this rise in diversity, such as whether it was triggered by novel ecological opportunities following the Cretaceous-Paleogene (K-Pg) mass extinction event 66 Ma. To test hypotheses on the timing of the mammalian radiation, studies commonly rely on analyses of fossil-only datasets, which often ignore the influence of phylogeny, or analyses of extant-only datasets, which struggle to recreate macroevolutionary patterns in deep time. Thus, an integrative approach is needed that incorporates paleontological data, neontological data, and phylogenetic comparative methods. To this end, we generated a time-calibrated meta-phylogeny

(‘metatree’) comprising over 3000 species of trechnotherians (therians and close relatives) from the Mesozoic and Cenozoic, based on 115 published character matrices and a molecular phylogeny of extant mammals. To quantify ecomorphological patterns, we collected jaw lengths (as a proxy for size) and jaw measurements that correlate with diet for 430 extinct and extant species. We then fit a suite of evolutionary models to the data to test various hypotheses on the i) timing of the start of the therian radiation and ii) potential shift in mode of evolution. Although results are sensitive to time-calibration methods and phylogenetic uncertainty, they generally show evidence for a shift in mode of evolution prior to the K-Pg boundary. For both the jaw correlates of diet and body size analyses, results suggest a shift from a constrained (Ornstein-Uhlenbeck) or stochastic (Brownian motion) mode of evolution to an ‘early burst’ mode of evolution, with the best-fitting models being those that model this shift occurring between 76 and 66 Ma. These results suggest that the ecological diversification of therians began in the latest Cretaceous, prior to the K-Pg extinction event. However, our results are also congruent with the hypothesis that the therian radiation was a multiple-step process that involved bursts in diversification at multiple points in time, such as following both the Cretaceous Terrestrial Revolution (ca. 80 Ma) and the K-Pg extinction event. Further, we emphasize the importance of continued efforts to collect early mammal fossils and resolve relevant stratigraphic information, which will allow for more robust tests on the timing of the mammalian radiation.

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

#### **VERTEBRAL FUSION IN A COLUBRIFORM SNAKE FROM THE LATE OLIGOCENE RUKWA RIFT BASIN, SOUTHWESTERN TANZANIA**

Grover, Tessa E.<sup>1</sup>, Montalvo, Ariana D.<sup>2</sup>, Roman, Kiara<sup>2</sup>, McCartney, Jacob<sup>2</sup>, Mtelela, Cassy<sup>3</sup>, Roberts, Eric M.<sup>4</sup>, Stevens, Nancy J.<sup>5</sup>

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