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205-4 - BODY SIZE AND LIFE HISTORY IN *LYSTROSAURUS*: NEW INSIGHTS FROM THE EARLY TRIASSIC OF NORTHWESTERN CHINA



Thursday, 29 October 2020

1:25 PM - 1:40 PM



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Abstract

Studies of the effects of mass extinctions have focused on their influence on geographic range sizes, evolutionary rates, population dynamics, and morphology. Few studies have examined growth strategies and life history which can provide crucial information on a taxon's survivorship and success following a mass extinction. Previous histological investigations of Permo-Triassic tetrapod survivors are largely limited to the Karoo Basin of South Africa. We used osteohistology and body size data in *Lystrosaurus* from northwestern China to investigate what factors might have contributed to its survival through the Permo-Triassic extinction and incredible abundance during the Early Triassic.

Our sample consists of twenty skeletal elements (humeri, femora, tibiae, radii, ulnae, fibulae, and ribs) spanning an inferred ontogenetic range from juvenile to adult that were recovered from the Induan Jiucayuan Formation. Twelve of the elements come from four individuals and the remaining eight were isolated elements. In addition to this histologic sample, an additional fifty-four hind limb elements were measured to capture the body size range in Chinese *Lystrosaurus*, the majority of which came from the same Jiucayuan Formation locality.

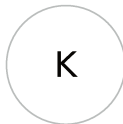
Our results indicate that Chinese *Lystrosaurus* grew rapidly, which is consistent with previous reports from South Africa. However, in sub-adult sized individuals,

the highly vascularized fibrolamellar bone tissue is interrupted by lines of arrested growth (LAGs) or annuli (regionalized bands where the vascular density and vascular canal size has decreased). LAGs are found in multiple regions of the cortex, including along the periosteal margin. This contrasts with Triassic *Lystrosaurus* specimens from South Africa, which rarely have growth marks. Interestingly, the largest and presumably most mature specimen in our sample shows uninterrupted growth. This suggests that *Lystrosaurus* from China had a high intrinsic rate of growth that was developmentally plastic and could arrest periodically, perhaps during times of environmental disturbance. In combination with our body size data, our histologic results suggest that Chinese *Lystrosaurus* grew to larger body sizes and may have had longer lifespans than their Gondwanan relatives.

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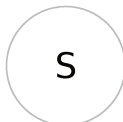
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12:30 PM - 4:30 PM



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FRESHWATER INPUT INFLUENCES TAXONOMIC AND BODY-SIZE VARIATION OF MARINE BIVALVE ASSEMBLAGE IN A TROPICAL ECOSYSTEM

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