



**S20 – 357: Break up of Gondwana and Vertebrate evolution**

***Late Cretaceous Mosasaurs (Squamata: Mosasauroidae) from the Maastrichtian of Marambio (=Seymour) Island, Antarctica***

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Mosasaurs were highly specialized squamates that invaded the marine realm during the Late Cretaceous. Their fossil records indicate that, after the first appearance about 98 Ma ago, they quickly diversified and radiated into marine environments all over the world. Explanations for their extinction comprise two hypotheses. One invokes a gradualist scenario, in which a widespread regression of epicontinental seas during the Maastrichtian produced a reduction of marine habitats and the decline of mosasaur well before the K/Pg boundary; while the other correlates mosasaur extinction with the big crisis at the K/Pg boundary triggered by a bolide impact. A catastrophic drop in planktonic productivity at the K/Pg would affect species up the food chain, including mosasaurs. If mosasaurs, as well as other apical predators such as plesiosaurs, were gradually driven into extinction it is expected that there would be a reduction in abundance, diversity, and biogeographic range of their fossil records well before the K/Pg. Recent researches carried out in Angola, as well as review of other K/Pg boundary sections containing mosasaurs, suggest a possible diversity decline prior to their extinction. Nevertheless, the collapse of marine productivity at the end of the Cretaceous could have been responsible for their total extinction.

The López de Bertodano Formation exposed on Marambio (=Seymour) Island, James Ross Basin, Antarctic Peninsula, represents the highest southern latitude onshore outcrop (~65°S now and during the Late Cretaceous) containing most of the Maastrichtian and the K/Pg transition. Abundant Mosasaurs recovered from this formation offer an opportunity to analyze how the pattern is observed in lower latitudes, that is if the diversity and abundance decrease prior to their total extinction, and therefore could be interpreted as a more global event. In order to test the abundance and diversity of late Maastrichtian mosasaur assemblages in high southern latitudes, paleontological prospecting under the Vertebrate Paleontological programme of the Instituto Antártico Argentino (Dirección Nacional del Antártico and Museo de La Plata, Argentina), were carried out on this formation. Marine reptile collecting efforts were intensified in this island during the last two summer working seasons (CAV 2014 and 2015). We considered the distribution multielement mosasaurs in stratigraphical intervals 2 to 10 corresponding to the informal units (KLB 210) of the López de Bertodano Formation. The K/Pg boundary has been identified by previous authors at the top of KLB 9 unit. Prospecting included also other marine reptiles (i.e. plesiosaurs). Field trips resulted in the discovery of abundant marine reptile remains. Considering only these two field trips, 33 new multielement marine reptile specimens have been identified. From these, 21 correspond to mosasaurs and the rest to plesiosaurs. The most outstanding feature of distribution of these findings is the concentration of skeletal remains at the top of the KLB 8 and base of KLB 9 units. Tooth materials associated with other cranial and postcranial skeletal bones, permit the preliminary identification of some mosasaurs specimens as *Prognathodon* sp; *Mosasaurus* sp, and *Plioplatecarpus* sp. In agreement with the significant abundance of marine reptile fossils, at the top of KLB 8 (paleomagnetic chron C30n) and the base of KLB 9 (paleomagnetic chron C29r), an increase in the diversity of macro invertebrate faunas has also been documented by other authors. Our results suggest that the last episode in the evolutionary history of southern high latitude mosasaurs was not characterized by a decline in their abundance and/or diversity, in turn a rapid extinction concentrated in the last 0.5 million years of the Maastrichtian.