Physical Drivers and Marine Tetrapod Evolution, Monday 8:45

**RECONSIDERING THE EXTINCTION OF ICHTHYOSAURS**

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Despite their extreme adaptation to life in the open sea, ichthyosaurs were one of the first major groups of post-Triassic marine reptiles to disappear, at the end of Cenomanian, whereas plesiosaurs, mosasaurs and numerous families of marine crocodiles and sea turtles disappeared during the Cretaceous/Paleocene Extinction Event. It has been proposed that unique biological factors drove ichthyosaurs to extinction, namely a break in the food chain at the level of belemnites or a progressive ecological replacement by teleost fishes since the Middle Jurassic. However, new discoveries in France and Russia turn both these hypotheses unsatisfactory because ichthyosaur diversity remained high during the Early Cretaceous both from taxonomic and ecological points of view, with the persistence of several Late Jurassic genera into the Early Cretaceous and the colonization of various feeding guilds. The extinction of ichthyosaurs during the Cenomanian was therefore more sudden than previously described. The present study aims at replacing the extinction of ichthyosaurs within the global context of changes in marine ecosystems during the ‘middle’ Cretaceous. The ‘middle’ Cretaceous (Aptian-Turonian) is indeed punctuated by numerous and profound global climatic and oceanic changes, as well as intense underwater volcanism. These factors led to recurrent anoxic events, sometimes of worldwide extension. Interestingly, the peak of changes in the geosphere, taking place during the Cenomanian, coincides with major biological changes within the marine realm: the rise of polycotylid plesiosaurs, marine squamates, teleost fishes and chondrichtyans, the onset of the ‘Chalk sea’, and an extinction within marine invertebrates communities. Ichthyosaurs disappeared during this profound reorganization of the marine ecosystems. However, the precise mechanisms that lead to the sudden extinction of these successful marine reptiles cannot be understood in the current state of our knowledge given the multitude of possible causes occurring at the same time.