

WEEK 2 THE END DEVONIAN EXTINCTION EVENT

Just as the burst of diversification was underway in the Devonian, the next big extinction event strikes. This occurs about 373 million years ago, in the late Devonian. The end-Devonian extinction event had a major effect on marine life, with about 87% of all species in the marine realm going extinct.

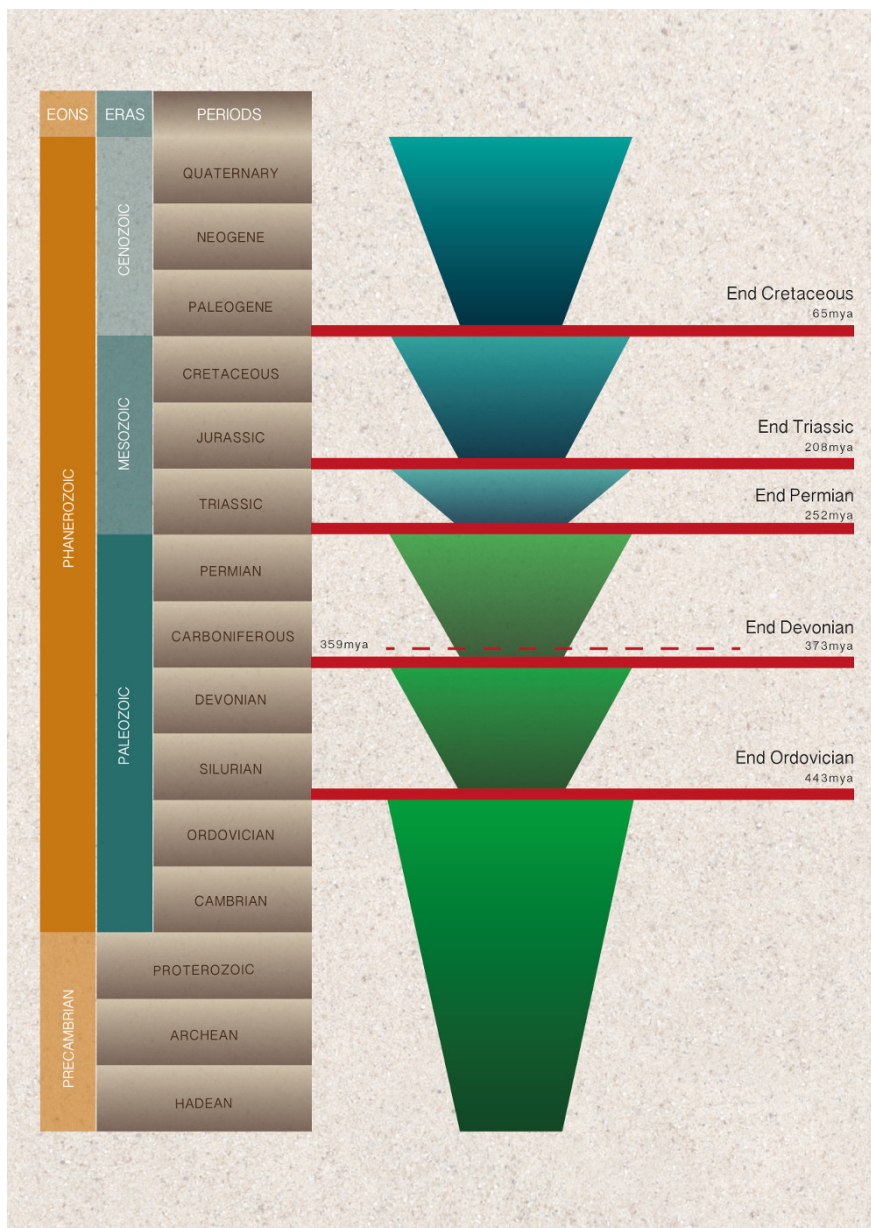
This event sees the extinction of placoderms and many trilobites, and only about 15% of brachiopods survive.

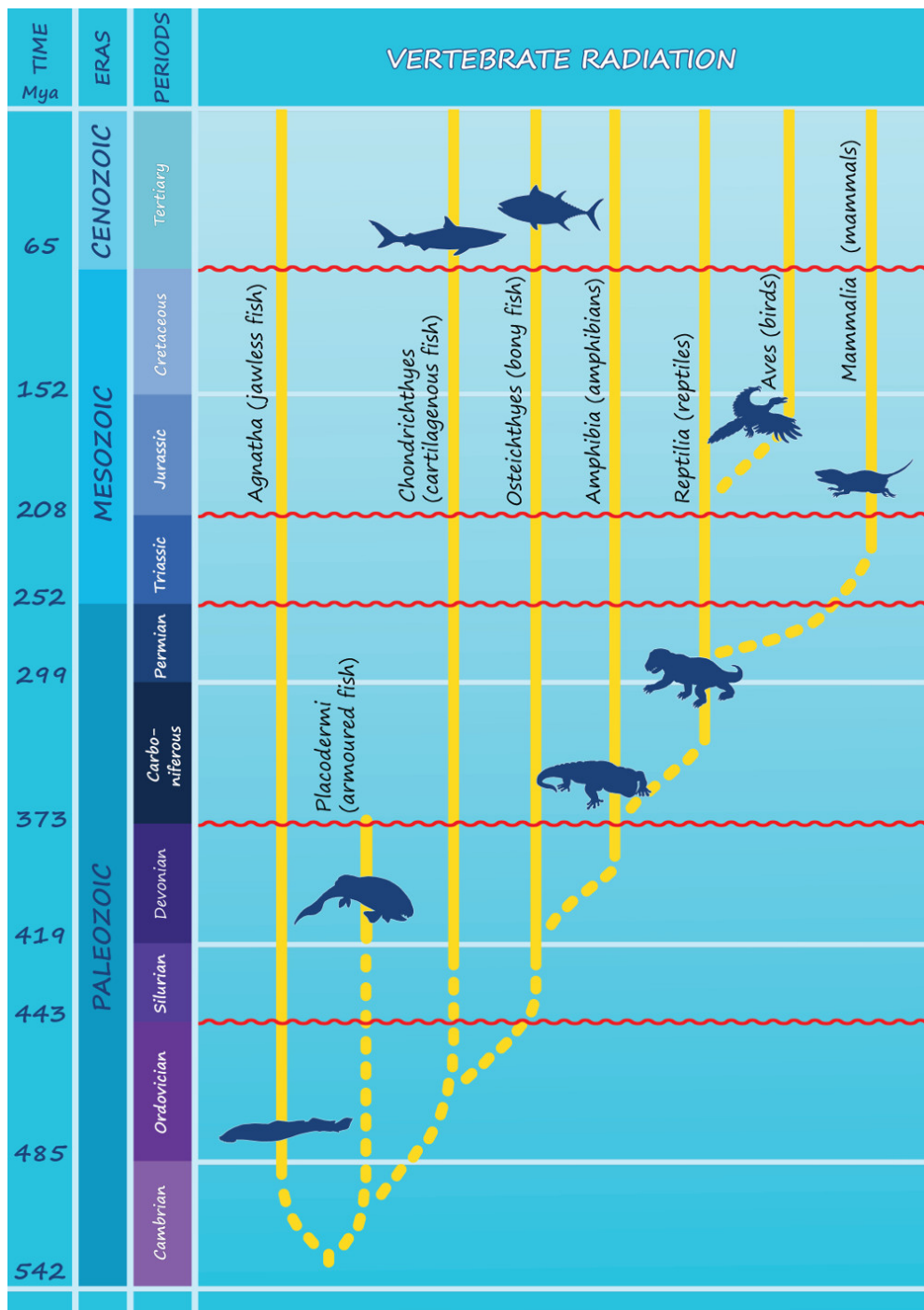
Exactly what caused this extinction event is uncertain. It seems likely that it was a result of a combination of several smaller events. As you will hear from my colleague, Rob Gess, in a video later this week, one of the main culprits for this extinction event is thought to have been the widespread forest that radiated at about this time. It is thought that the vascular plants use carbon dioxide from the atmosphere, and their roots break down rocks. In so doing, nutrients and minerals are released and eventually leach out into the oceans. This may have triggered algal blooms in the oceans, and when the algae were later broken down by bacteria, they used up all the oxygen, resulting in anoxic conditions in the oceans, which caused the death of animals living therein.

Thus, the success of vascular plants may have had a negative impact on life in the oceans, and later on, as land plants established themselves more and more, they removed carbon dioxide from the atmosphere. This depletion of carbon dioxide, which is normally a greenhouse gas that traps heat, would have made the earth cool. This eventually resulted in glaciers forming that trapped water on land and reduced sea levels, causing even more damage to aquatic ecosystems. It is thought that this extinction event was rather long and drawn out, and that it occurred in two waves, at about 373 million years ago and then at about 359 million years ago.

After the major catastrophe at the end of the Devonian, the fossil record shows a host of new forms, major radiations of the cartilaginous fishes and the ray-finned fishes. Both these were part of the aquatic fauna previously, but in rather low numbers. Their radiation is spurred on afterwards.

Around this time, the lobe-finned fish that were already changing their fins to limbs in the Devonian become the tetrapods. That is the first four-legged animals that make the first tentative steps onto land. These early tetrapods later give rise to amphibians, reptiles and mammals.





Anusuya Chinsamy-Turan 2017

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