

Ancient volcano may have caused mass extinction

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A previously unknown giant volcanic eruption that led to global mass extinction 260million years ago has been uncovered by scientists at the University of Leeds.

The eruption in the Emeishan province of south-west China unleashed around half a million cubic kilometres of lava, covering an area 5 times the size of Wales, and wiping out marine life around the world.

Unusually, scientists were able to pinpoint the exact timing of the eruption and directly link it to a mass extinction event in the study published today in *Science*. This is because the eruptions occurred in a shallow sea - meaning that the lava appears today as a distinctive layer of igneous rock sandwiched between layers of sedimentary rock containing easily datable fossilised marine life.

The layer of fossilised rock directly after the eruption shows mass extinction of different life forms, clearly linking the onset of the eruptions with a major environmental catastrophe.

The global effect of the eruption is also due to the proximity of the volcano to a shallow sea. The collision of fast flowing lava with shallow sea water caused a violent explosion at the start of the eruptions - throwing huge quantities of sulphur dioxide into the stratosphere.

"When fast flowing, low viscosity magma meets shallow sea it's like throwing water into a chip pan - there's spectacular explosion producing

gigantic clouds of steam," explains Professor Paul Wignall, a palaeontologist at the University of Leeds, and the lead author of the paper.

The injection of sulphur dioxide into the atmosphere would have led to massive cloud formation spreading around the world - cooling the planet and ultimately resulting in a torrent of acid rain. Scientists estimate from the fossil record that the environmental disaster happened at the start of the eruption.

"The abrupt extinction of marine life we can clearly see in the fossil record firmly links giant volcanic eruptions with global environmental catastrophe, a correlation that has often been controversial," adds Professor Wignall.

Previous studies have linked increased carbon dioxide produced by volcanic eruptions with mass extinctions. However, because of the very long term warming effect that occurs with increased atmospheric carbon dioxide (as we see with current climate change) the causal link between global environmental changes and volcanic eruptions has been hard to confirm.

The paper 'Precise coincidence of explosive volcanism, mass extinction and carbon isotope fluctuations in the Middle Permian of China' is published in *Science*.

Source: University of Leeds

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