Terrestrial biodiversity recovered faster after Permo-Triassic extinction than previously believed

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While the cause of the mass extinction that occurred between the Permian and Triassic periods is still uncertain, two University of Rhode Island researchers collected data that show that terrestrial biodiversity recovered much faster than previously thought, potentially contradicting several theories for the cause of the extinction.

David Fastovsky, URI professor of geosciences, and graduate student David Tarailo found that terrestrial biodiversity recovered in about 5 million years, compared to the 15- to 30-million year recovery period that earlier studies had estimated. The recovery period in the marine environment is believed to have taken 4 to 10 million years, about twice as long as the recovery period after most other mass extinctions.

The results of their research were presented today at the annual meeting of The Geological Society of America in Minneapolis.

"Our results suggest that the cause of the extinction didn't spill over as severely into the terrestrial realm as others have claimed," said Fastovsky. "There was still a terrestrial extinction, but its repercussions weren't more long term than those in the marine realm, and possibly less."

Since the URI study suggests that the terrestrial realm recovered at least as fast as the marine realm, it rules out those theories stating that the

extinction, which took place about 251 million years ago, was caused by global events affecting both the marine and terrestrial environments equally.

The researchers compiled fossil faunal lists from the Moenkopi Formation in northeastern Arizona, which contains fossil vertebrates from the Middle Triassic, and compared them to faunas from the nearby Chinle Formation, containing Late Triassic fauna.

According to Tarailo and Fastovsky, if it took 30 million years for the terrestrial fauna to recover, then the older formation should have lower diversity than the younger one, because it would still be compromised by the conditions that caused the extinction. But they found the diversity to be comparable, meaning that the diversity recovered more rapidly than that.

"Some may argue that our results are just one data point in North America, but if North America is representative of the rest of the world, then our results apply to the entire world," Fastovsky said.

The researchers' next step is to expand their analysis to other fossil deposits around the world using the same techniques to test their results.

Provided by University of Rhode Island