

Study of Earth's crust tells of first plate tectonics and life on Earth

January 30 2014



Ancient rocks in Quebec hold secrets to the early Earth

Provocative new research published this month in the journal *Geology* suggests that oceanic plate subduction was operating from the earliest times in Earth's history, meaning conditions for the formation of life may have existed up to a billion years earlier than generally thought.

These findings came from a team of Australian researchers, who

analysed similarities between modern-day subduction zones near Japan and early-Earth rock sequences from Quebec, Canada.

Subduction is a process whereby an oceanic plate descends beneath another plate (a characteristic of modern [plate tectonics](#)).

Lead author, Macquarie University's Professor Simon Turner says, "Modern subduction settings, such as the Mariana arc, have all the right chemical ingredients to grow and sustain primitive life forms.

"From the similarities of our research into the earlier deposits from Canada, it follows that the conditions for the formation of life may have existed much earlier, with subduction starting far longer ago than we'd thought previously."

The early Earth's geological processes remain a fundamental question for the earth sciences and the rareness of rocks from this time period make exploration a significant challenge.

"We expect that this research will result in a lot of debate across the discipline, as there's much that is yet to be discovered in the processes and earliest records of subduction. Our next steps are to investigate Zn isotopes which could show whether high pH fluids were present to stabilise amino acids, and we'll continue to explore the secrets under the Earth's crust".

More information: Simon Turner, Tracy Rushmer, Mark Reagan, and Jean-Francois Moyen. "Heading down early on? Start of subduction on Earth." *Geology*, G34886.1, first published on January 6, 2014, [DOI: 10.1130/G34886.1](#)

Provided by Macquarie University

Citation: Study of Earth's crust tells of first plate tectonics and life on Earth (2014, January 30)
retrieved 15 May 2024 from <https://phys.org/news/2014-01-earth-crust-plate-tectonics-life.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.