Research may explain controversies related to great magma eruptions
3 April 2018

"Previous geophysical research has indicated features suggestive of mantle plumes, whereas geochemical studies have concluded based on lava compositions that there was no plume and that the magmas formed when the temperature of the upper mantle gradually got higher under Pangea. The supercontinent acted like a kettle lid," Luttinen says.

The previous studies of magma sources have mainly focused on a certain part of the widespread lava formation, however. The study published on March 27 in the international journal *Scientific Reports* scrutinised compositions of lava samples across the whole region of ancient magma eruptions. Their chemical signatures indicate that lavas in different areas had a different origin.

"The magmas had in fact two contrasting sources. One of them was the upper mantle, as suggested in previous research, whereas the other was most probably a deep mantle plume. Involvement of two different magma sources explains previous contradictory results and presents an interesting new framework for future studies," concludes Luttinen.

Remnants of the ancient ocean of lava, the so-called Karoo magma province, are still widespread in southern Africa and have been also discovered in Antarctica. Dr. Arto Luttinen from the Finnish Museum of Natural History, University of Helsinki, has studied the lava formations on both continents with his group.

"This kind of eruptions are culmination events of planetary evolution and have caused mass extinctions of life. Yet their origin remains an outstanding question of Earth history," Luttinen explains.

The scientists disagree, for example, whether an enormous ascending plume of hot material caused the generation of magmas from the core-mantle boundary.
the Victoria Falls, Africa. Credit: Arto Luttinen


Provided by University of Helsinki


*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.*