Newly discovered microbe holds key to global warming

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Scientists document the temperature of soil, one layer above permafrost. Credit: Dr Virginia Rich, University of Arizona.

(Phys.org) — Scientists from The University of Queensland have discovered a microbe that is set to play a significant role in future global warming.

UQ's Australian Centre for Ecogenomics researcher Ben Woodcroft said the methane-producing micro-organism, known as a 'methanogen', was thriving in northern Sweden's thawing permafrost in a thick subsurface layer of soil that has previously remained frozen.

Mr Woodcroft said no one knew of the microbe's existence or how it worked before the research discovery.

He said global warming trends meant vast areas of permafrost would continue to thaw, allowing the microbes to flourish in organic matter and drive methane gas release, which would further fuel global warming.

"The micro-organism generates methane by using carbon dioxide and hydrogen from the bacteria it lives alongside," Mr Woodcroft said.

Lead researcher and UQ's Australian Centre for Ecogenomics Deputy Director Associate Professor Gene Tyson said the findings were significant.

"This micro-organism is responsible for producing a substantial fraction of methane at this site," he said.

"Methane is a potent greenhouse gas with about 25 times the warming capacity of carbon dioxide."

The researchers showed the organism and its close relatives live not just in thawing permafrost but in many other methane-producing habitats worldwide.

The team made the discovery by using DNA from soil samples and reconstructing a near-complete genome of the microbe, bypassing traditional methods of cultivating microbes in the lab.

More information: "Discovery of a novel methanogen prevalent in thawing permafrost." Rhiannon Mondav, et al. Nature Communications 5, Article number: 3212 DOI: 10.1038/ncomms4212. Received 11 June 2013 Accepted 07 January 2014 Published 14 February 2014

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