Chamber measurements find plants potentially important methane sink

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As a greenhouse gas, methane has a much higher heat-trapping potential than carbon dioxide when considered over the course of a few decades. In recent years, researchers discovered a potentially important new source of atmospheric methane-emissions from green plants.

Though estimates of the extent of vegetative methane emissions vary greatly, previous research suggests they could amount to as much as a tenth of global annual emissions. The mechanism behind such emissions is a matter of considerable debate, with questions remaining regarding the effects of atmospheric or soil conditions, local hydrological influences, and variability for different plant species. Also under investigation are various potential plant methane uptake mechanisms, or the effects of methane- consuming bacteria-aspects of the methane cycle that could dampen plants' role as a methane source.

To determine the overall effect of some boreal tree species on atmospheric methane, Sundqvist et al. used branch chamber measurements to directly assess the net gas exchange for birch, spruce, pine, and rowan trees in a Swedish forest. The authors find that all four tree species were net absorbers of atmospheric methane, meaning they served as a sink rather than a source. The authors analyzed how the methane exchange varied with changes in the availability of photosynthetically active radiation (PAR), temperature, photosynthesis rate, and ultraviolet radiation levels. For birch, spruce and rowan trees, but not pine, they find that an increase in PAR caused the trees to take up more methane. They find that temperature changes had inconsistent

effects on methane exchange.

The authors suggest that plants could actually be an important global sink, rather than source, for atmospheric methane.

More information: Atmospheric methane removal by boreal plants, *Geophysical Research Letters*, doi: 10.1029/2012GL053592, 2012

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