

Wednesday, 11 January 2006, 23:04 GMT

## **Plants revealed as methane source**

**By Tim Hirsch**

BBC News environment correspondent



**Scientists in Germany have discovered that ordinary plants produce significant amounts of methane, a powerful greenhouse gas which helps trap the sun's energy in the atmosphere.**

The findings, reported in the journal *Nature*, have been described as "startling", and may force a rethink of the role played by forests in holding back the pace of global warming.

And the BBC News Website has learned that the research, based on observations in the laboratory, appears to be corroborated by unpublished observations of methane levels in the Brazilian Amazon.

Until now, it had been thought that natural sources of methane were mainly limited to environments where bacteria acted on vegetation in conditions of low oxygen levels, such as in swamps and rice paddies.

### **Methane 'increase'**

But a team led by Frank Keppler of the Max Planck Institute in Heidelberg, Germany, stumbled upon this new effect when studying emissions from the leaves of trees and grasses in

conditions similar to those they would encounter in the open air.

To their amazement, the scientists found that all the textbooks written on the biochemistry of plants had apparently overlooked the fact that methane is produced by a range of plants even when there is plenty of oxygen.

The amount of the gas produced increased when the air was warmer, and when there was more sunlight. The paper estimates that this unexplained phenomenon could account for between 10 and 30 per cent of the world's methane emissions.

The possible implications are set out in *Nature* by David Lowe of New Zealand's National Institute of Water and Atmospheric Research, who writes, "We now have the spectre that new forests might increase greenhouse warming through methane emissions rather than decrease it by sequestering carbon dioxide."



If this turned out to be true, it would have major implications for the rules of the Kyoto Protocol on climate change, which allows countries and companies to offset emissions from the burning of fossil fuels like coal and oil by funding the planting of new forests or the restoration of deforested areas.

But some experts on climate change science and policy say it is far too early to come to this kind of conclusion.

Dr Halldor Thorgeirsson, deputy executive secretary to the UN Climate Change Secretariat, told the BBC News Website that while the study was interesting, the overall impact of this newly-

discovered source of methane was still speculative.

"We need to look at this, but this study does not for example look at measurements of direct methane emissions from forests, and that is what is needed to get a better handle on what forests do for the climate," said Dr Thorgeirsson.

He added that the system of calculating forestry "credits" under the Kyoto protocol allowed for updated scientific findings to be included in the assessment of the climate benefit of any particular project.

*"Until we know how this process works it is really unwise to come to any conclusions"*

**Michael Keller**

**US Department of Agriculture's Forest Service**

The authors of the study themselves recognise that it is very difficult to quantify the global impact of this discovery since it is so far confined to observations of plants grown in the laboratory.

But it is already finding some corroboration from observations in the "real world".

The BBC News website has learned that a study soon to be published in another scientific journal reports high levels of methane in measurements taken in the Brazilian Amazon, which can't be explained by conventional explanations for how the gas is produced.

Michael Keller of the US Department of Agriculture's Forest Service, who carried out the study, said the new process discovered by the German scientists provided a plausible solution to the puzzle.

But he warned against making any assumptions at this stage about what it meant for the climate impact of forests until much

more was known about the way this new phenomenon operates in different conditions and among different species.

### **Complex relationship**

Dr Keller said, "We know that when deforestation takes place we liberate large quantities of carbon dioxide, and indeed methane, into the atmosphere. We may be replacing that forest with vegetation which produces more methane.

"Until we know how this process works it is really unwise to come to any conclusions."

It is tempting to conclude from this new study that in some way we have been conned into thinking that trees were great for the planet when it turns out they might be helping to cause global warming.

In fact, of course, trees are neither good nor bad. They are just there, and if they are producing methane now they always have been in natural conditions.

The study highlights, however, the extreme complexity of the relationship between the biological processes of the Earth and the chemistry of our atmosphere - and how much there is yet to discover.