



## **Structure and function of microbial communities: a case study in methanotrophy**

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Methane is next to CO<sub>2</sub> the most important greenhouse gas contributing about 20% of the total from all of the long-lived greenhouse gases. While most atmospheric methane is oxidized reacting with OH, methane oxidizing bacteria provide the only biological sink. High-affinity methane oxidation is found in upland soils consuming methane at atmospheric mixing ratios, while low-affinity methane oxidation has a different function: it works like a filter preventing methane produced in anoxic environments to escape into the atmosphere. Recent work has shown that the function of this process is under influence of different environmental factors, e.g. Nitrogen-availability and plant species. The effects observed seem to depend on species composition of methane oxidizing bacteria making community structure and diversity a control of function. Results from past and ongoing (e.g., EuroDIVERSITY) programmes are used to review the state of the art and to outline future directions of research.