

Effect of water availability on nitrous oxide and methane emissions from stems of *Fagus sylvatica* and *Alnus glutinosa*

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Together with carbon dioxide and water vapour, methane (CH₄) and nitrous oxide (N₂O) are the most important greenhouse gases contributing to global climate change. CH₄ and N₂O produced in soils by microorganisms are emitted from pedosphere to atmosphere either directly or mediated by plants. Over the last decades, N₂O and CH₄ emission into the atmosphere were almost exclusively investigated with herbaceous plants and mostly restricted to plants possessing an aerenchyma system. If trees were investigated, studies focused on species naturally living in riparian forests, which are well adapted to flooding by the formation of aerenchyma and lenticels. In contrast, information on the role of upland tree species, lacking an aerenchyma system, in the exchange of N₂O and CH₄ between terrestrial ecosystems and the atmosphere is scarce.

The objective of our study was to characterise, quantify and compare the emissions of CH₄ and N₂O from stems of *Alnus glutinosa*, a representative of the softwood riparian wetland tree species, and of *Fagus sylvatica*, a common broadleaf upland tree species, as affected by flooding. Moreover, soil emissions of both trace gases were measured to estimate the significance of stem emissions for total emissions from these ecosystems. Results obtained from the study with *A. glutinosa* and *F. sylvatica* grown in greenhouse based microcosms under controlled conditions will be presented.