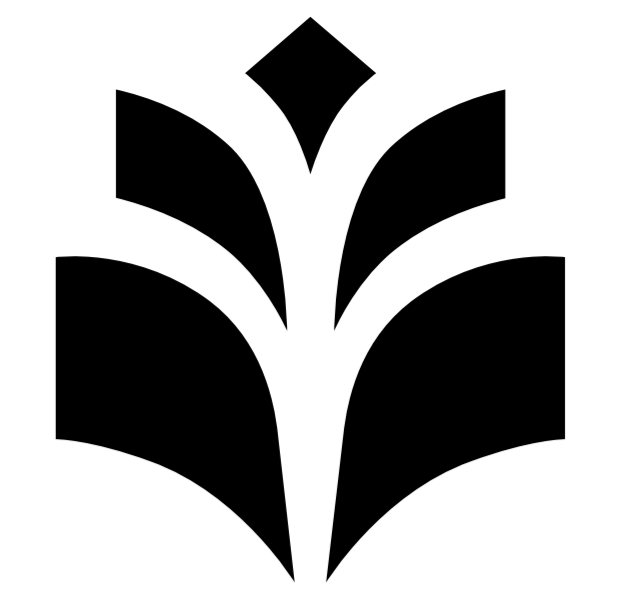


# THE MOLECULAR COMPOSITION OF DISSOLVED ORGANIC MATTER (DOM) AND ITS EFFECTS ON THE GREENHOUSE GAS PRODUCTION IN PRISTINE SUBARCTIC RIVERS



UNIVERSITY OF  
EASTERN FINLAND

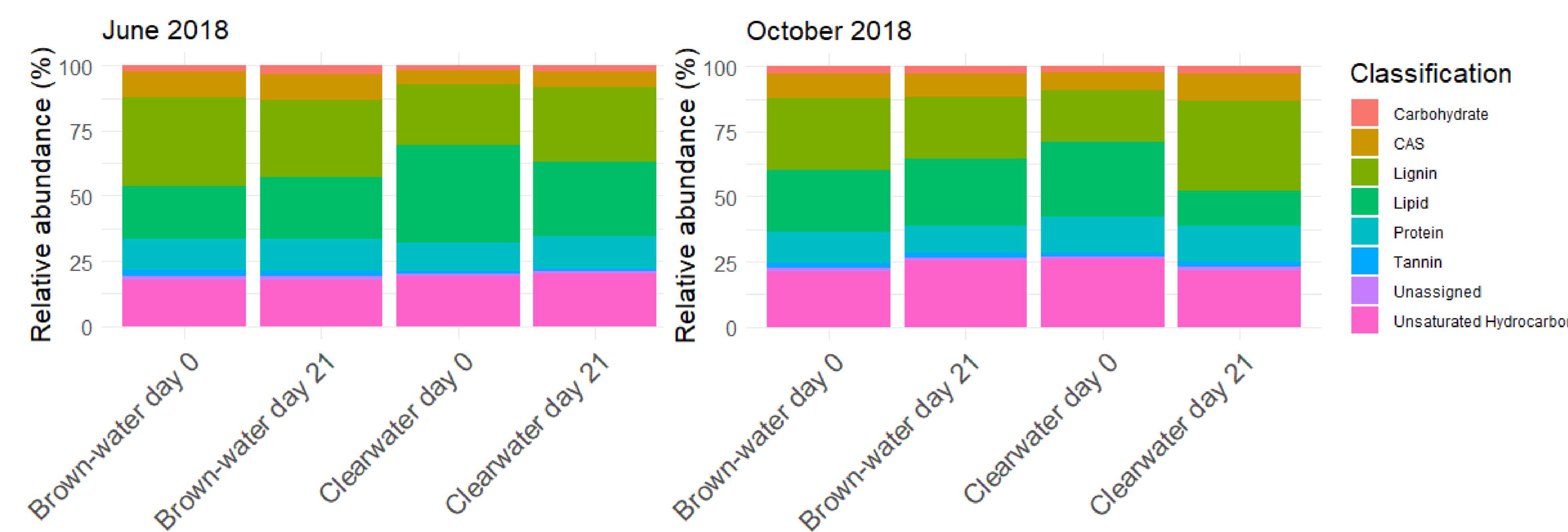
## RESEARCH QUESTION

*How the source and molecular composition of DOM influence its microbial processing in two contrasting rivers?*

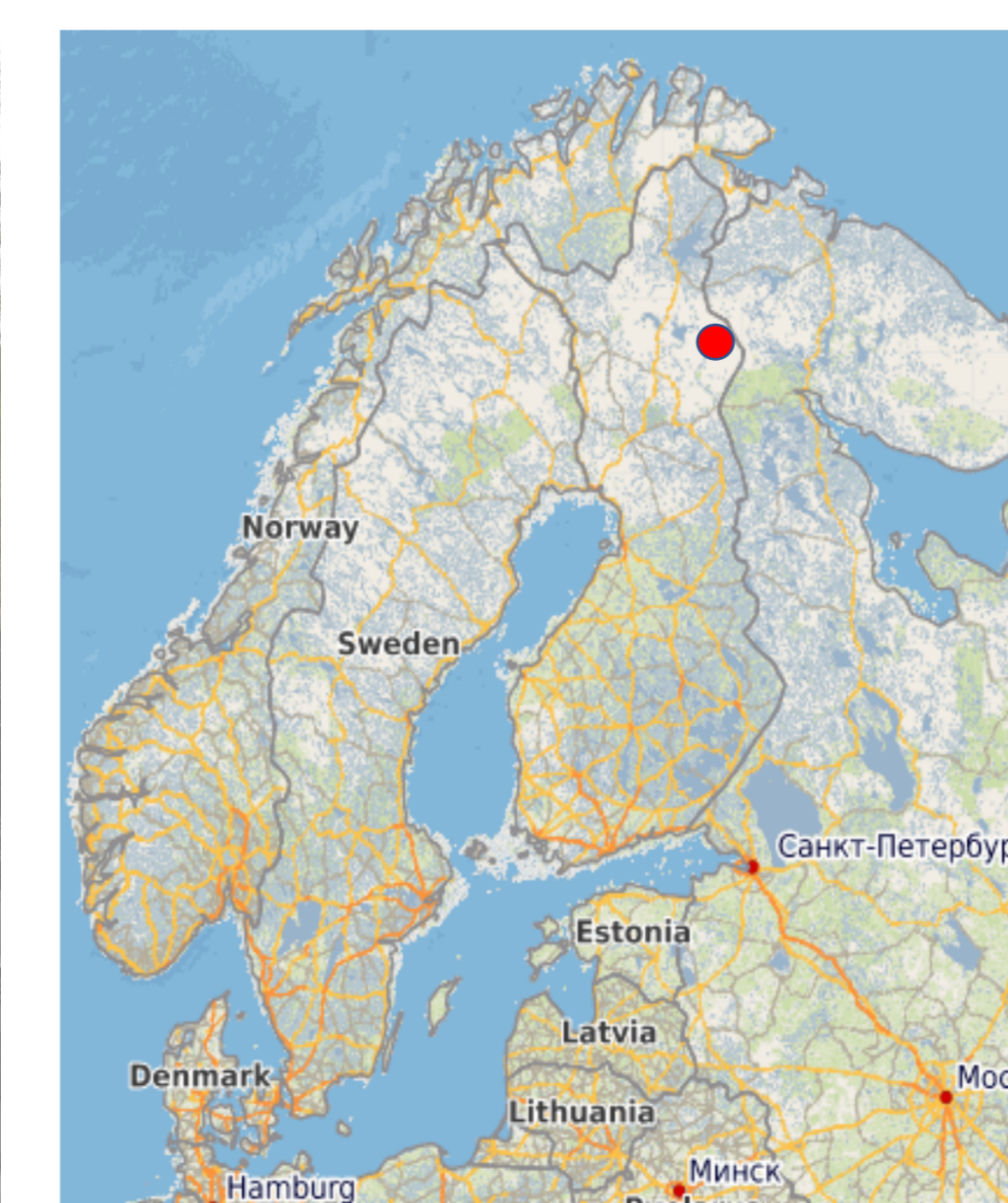
## METHODS

- Water sampling during June and October 2018 from **two pristine subarctic rivers in Finnish Lapland**
- 21-day incubation studies following the changes in DOM, carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>)
- DOM molecular characterization with electrospray ionization (ESI) coupled to high-resolution Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS)

## RESULTS



	June 2018		October 2018	
	Brownwater	Clearwater	Brownwater	Clearwater
CO <sub>2</sub> (μmol L <sup>-1</sup> d <sup>-1</sup> ) day 0	14.6 ± 5.0	20.3 ± 6.6	9.6 ± 5.8	3.7 ± 0.9
CO <sub>2</sub> (μmol L <sup>-1</sup> d <sup>-1</sup> ) day 21	21.5 ± 9.0	26.7 ± 13.6	11.3 ± 3.3	5.4 ± 2.1
TOC (μmol L <sup>-1</sup> ) day 0	372 ± 131	345 ± 119	979 ± 234	618 ± 155
TOC (μmol L <sup>-1</sup> ) day 21	344 ± 167	260 ± 52	519 ± 66	307 ± 124
TN (μmol L <sup>-1</sup> ) day 0	10.9 ± 2.2	5.5 ± 2.1	15 ± 5	9.9 ± 5.4
TN (μmol L <sup>-1</sup> ) day 21	8 ± 4.6	5.2 ± 0.9	9.3 ± 1.3	7.6 ± 3



## CONCLUSIONS

- **Brown-water river surrounded by peatlands contained more lignin-like molecules and condensed aromatic structures (CAS) → slow to decompose**
- **Maximum DOM decomposition in Clearwater river during summer**

## ACKNOWLEDGEMENTS

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