# The origin and fate of **OM in circum-Arctic** subglacial ecosystems.

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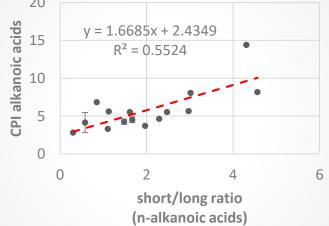
FACULTY OF SCIENCE Charles University

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Melting glaciers supply and nourish proglacial habitats and coastal ecosystem with 'starter pack' incl. microbial cells and readily available nutrients...

#### Age-related degradation of OM 7 6 $y = 194.81x^{-3.319}$ **CPI alkanes** 5 4 3 2 5 $R^2 = 0.4562$ 2 0 3.9 4.9 3.4 4.4 log10 (cal years BP) 20 y = 1.6685x + 2.4349



## ...while emerging subglacial sediments open a

### window into times of glacier advances

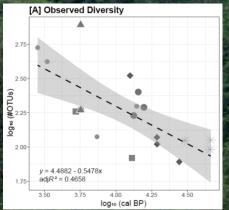
1.8 -

Matter of time, even though on a thousands-year time scale.

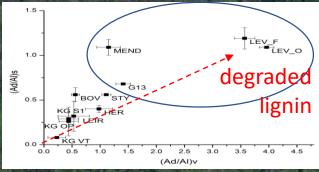
> Microbial diversity decrease, versataile classes are true survivilists below glaciers (i.e. Betaproteobacteria).

> OM derived from higher plants is being degraded when beneath glaciers. > highly degraded OM found to be older than 13.5 thousand cal BP (CPI < 2) However,

> lignin is tough and rather put 'on hold' (was observed mostly at a less degraded stage)



#### Angiosperm 1.6 grasses & leaves SS Angiosperm 1.4 wood 1.2 1.0 KGS1<sup>⊥</sup> KGOP 0.8 LEV F<sup>+</sup>KGVT HER LEV O MEND Pine 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 C/V



Fate of microbes? Total abundance and diversity both decrease with time spent on 'lockdown' beneath glacial ice mass.

> OIVI derived from microbes, mosses and plants show rather fresh input, indicating an active component of subglacial ecosystem.





(Greenland and Svalbard).

Map of sampling sites Alaska Russian Arc Russia Svalbar Disko Island Greenland celant Greenland ke Sheet Arctic Cirde Greenland Ice Sheet Region pin Iceland

Ice cave opening – Leverett Glacier (Greenland Ice Sheet)

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