

**TBI Symposium 2019,
20 and 21 February, Umeå**



4th International TBI symposium

UmU – Umeå University

Location: 'Älgsalen'. Tvistevägen 48, Umeå

Organisers: Judith Sarneel (UMU), Taru Sandén (AGES) and Sara Strandberg (UmeaCongress)

Contact: Judith Sarneel (judith.sarneel@umu.se)



The TBI team: While drinking a cup of tea, Joost Keuskamp, Taru Sandén, Mariet Hefting and Judith Sarneel soon realized what tea bags could be used for. The TBI team published the standardized method in 2013. Since then they initiated many TBI initiatives such as teatime4science, teatime4schools, Tea in OTC and teatime in NETLAKE

Elena Kinz works at *Open Science – Life Sciences in Dialogue* in Vienna, an Austrian non-profit organisation which fosters the dialogue between science and the public. Open Science runs the Vienna Open Lab, a hands-on life science laboratory for the public with over 12.000 visitors a year and offers science communication training for researchers. Citizen science and public outreach projects of different life science disciplines are the cornerstones of Elena's work. Elena is a trained biochemist, science communicator and project team member of the citizen science project TeaTime4Schools, currently applying the TBI-method with 150 school classes in Austria.



Ellen Dorrepaal plant ecologist with a passion for the ecosystems of cold areas. My research aims to answer questions such as how do plants and their interactions control ecological processes (among which decomposition), how do different plant species or groups of plants vary in their responses to climate change or their effects on ecosystem functioning, and what does this mean for the feedbacks of northern ecosystems to carbon cycling and climate change.

20 February

9:00 Welcome and practical information

9:05-9:30: **TBI science, where are we now?** By the TBI team

9:30 – 9:50 Raúl Ochoa-Hueso

Climatic and microbial controllers of litter decomposition under nutrient enrichment in global grasslands

9:50 – 10:10 Hao Tang

Plant-ecotype control on soil decomposition processes in response to sea level rise

10:10 – 10:30 Marshall McDaniel

Decomposition of Household Items (including Rooibos and Green Tea) as Low-cost Indicators of Soil Health

10:30 – 10:50 Lorenzo Brusetti

Microbial communities in litter: a comparison between local and external substrates along a European transect

10:50 – 11:00 coffee break

11:00 – 12:30: Discussion groups and breakup in groups preparing for the review article

1. Microbiology
2. Agricultural systems
3. Different systems
4. Material characteristics (when enough interest)

12:30-13:30: Lunch

13:30-17:00 **Elena Kinz**

How to communicate your soil science (using tea bags)

Soil science is a black box for society. Yet it is the ecosystem that is always close to humans, directly under their feet. How to overcome fear for dirty hands and fungi and other things that live in soil?

How to explain that healthy soils are crucial and how to communicate about your (soil) research to society. But, especially how to do this in a constructive way?

19:00 Conference dinner

21 February

9:00 Welcome

9:00-9:45: **Ellen Dorrepaal**, Sylvain Monteux, Frida Keuper, James Weedon

Interacting controls on decomposition in thawing permafrost ecosystems

Abiotic environment, quality of litter, and composition and functioning of the decomposer community are generally thought to control decomposition rates. Understanding their roles is crucial for predicting carbon-feedbacks to our climate and has therefore received much attention. Thereto, often one factor is varied while the other are kept constant. Yet, in ecosystems undergoing climate change, factors controlling decomposition will not operate in isolation and therefore likely interact, but such ecosystem-mediated controls remain poorly understood. We investigated how climate warming and associated changes in plant community can alter the microbial community in thawing permafrost soils, and how these interactions may affect microbial decomposition, using three experiments. In the laboratory, we observed that functional limitations of microbial communities can hamper *in vitro* decomposition of old Yedoma permafrost, which was relieved by inoculation with exotic microorganisms. Microbial community structure thus matters for permafrost decomposition. In a garden experiment with five

typical permafrost tundra plant species grown in *Sphagnum* peat or newly-thawed permafrost peat, we then investigated how soil microbial community depends on plant species. In *Sphagnum* peat topsoil, the plant species did not harbour different rhizosphere bacterial communities, but they did when grown in sub-surface permafrost peat. Plant species might thus differentially affect functional microbial limitations in thawing permafrost soil, and climate change-induced vegetation changes might alter microbial decomposition in thawing permafrost. Finally, we showed in a field-scale *in situ* permafrost-thaw experiment in a palsa peatland, how 10-years of thawing and colonization by deep-growing sedge roots caused colonization of thawing permafrost soil by overlying soil microbes. In turn, bacterial community structure, but not root colonization, helped soil quality to explain variation in soil respiration, but these relations interacted with the decadal deep thaw treatment. Our results suggest that climate-plant-decomposer interactions play an important role in the functioning and feedbacks of thawing permafrost.

9:45 – 10:05 Ada Pastor

Plunging into Arctic waters: using the TBI to assess decomposition in Greenland streams

10:05 – 10:25 Michelle Carbognani

Soil moisture and vegetation type modulate the influence of temperature on litter decomposition

10:25 – 10:45 Andrea Lopez

Drought affects the summer litter decomposition rate of six central North American Grasslands

10:45-11:00 coffee break

11:00 – 11:20 Nina Filippova

Decomposition in Mukhrino field station, Western Siberia

11:20 – 11:40 Taru Sandén

Citizen scientist perspective on TBI

11:40-12:00 FastForwardPresentations. 3 min talks and 2 min for questions.

1. **Guillaume Patoine** iSBio Consortium: exploring global soil biodiversity and function distribution
2. **Marina Partain** Investigating the impact of soil wetness on plant litter decomposition using low-cost soil moisture probes and off-the-shelf tea bags
3. **David Watson** Measuring resource availability for ground-foraging insectivores
4. **Angelika Xaver** Investigating the impact of soil wetness on plant litter decomposition using low-cost soil moisture probes and off-the-shelf tea bags
5. **You?** space for spontaneous contributions

12:00-13:30: Lunch + Poster presentations

13:30-16:30 Working group meetings

1. TBI in warming experiments
2. TBI review article

13:30-xxx Skiing trip in the Gammlia forest or on the Nydala lake.