**Herbivory Network: collaborating to study herbivory in northern and alpine environments**

Isabel C BARRIO1, C Guillermo BUENO2, David S HIK3, Ingibjörg S JÓNSDÓTTIR1,4, Martin MÖRSDORF1,4,5, Virve T. RAVOLAINEN6

**...why HERBIVORY?**
- key biotic interaction in tundra ecosystems, through effects on biodiversity, energy flows and nutrient cycling
- herbivores seem to influence the responses of tundra plant communities to environmental changes
- outcomes of herbivory vary regionally and often depend on site-specific characteristics, e.g. productivity, human management, geological substrate or species diversity

**Development of standardized protocols**

**ITEX herbivory protocol**
In collaboration with the International Tundra Experiment, these measurements will allow understanding the combined effect of warming and herbivory on tundra plants

**Soil protocol**
Soils are a key element of tundra ecosystems, limiting the survival, growth and reproduction of plants, but the effects of herbivory on tundra soils are still largely unknown.

**Invertebrate herbivory protocol**
Invertebrate herbivory is often overlooked in tundra ecosystems but we still lack basic understanding on how much biomass is actually removed by invertebrate herbivores?

**Vertebrate herbivory protocol**
Co-occurring vertebrate herbivores feed at different intensities, frequencies and spatial scales. We are developing a set of measurements of common herbivory currency to make vertebrate herbivory comparable among different sites.

**Design of a coordinated experiment**

The implementation of a geographically-balanced, coordinated experiment will ultimately enhance our understanding of the role of herbivory in northern and alpine environments.

**Ongoing HN activities**
One of the priorities of the HN is to integrate study sites, methodologies and metrics used in previous work, homogenize data collection and ensure meaningful comparisons across studies. A main goal of HN is to address research questions and synthesize knowledge on the role of herbivory in northern and alpine ecosystems. And of course, to serve as communication platform for researchers and stakeholders.

**Answering research questions**

**What drives herbivore diversity in the Arctic?**
The composition of herbivore communities can affect the outcomes of plant-herbivore interactions. Analysing the larger scale patterns of herbivore diversity in the Arctic will clarify the drivers of variation in herbivory at a broad pan-Arctic scale.

**Can we identify explicit procedures that increase comparability between different studies of herbivory?**
Study designs for sampling plant-herbivore interactions, where both mobile and sessile organisms are involved, remain a challenge. We need common tool-sets to increase reproducibility and comparability of studies that evaluate the role of herbivory in different tundra sites.

**...why a NETWORK?**
Understanding the role of herbivory in tundra ecosystems at a global scale, and what drives its spatial and temporal variation requires coordinated research efforts.

The Herbivory Network covers this gap, by fostering collaborations within and across disciplines and facilitating synthesis and multi-site comparisons through the use of common standardized protocols.

**For more information:**
http://herbivory.biology.ualberta.ca
herbivory.network@gmail.com

---

1Institute of Biology, University of Iceland, Askja, Sturlugata 7, Reykjavik IS-101, Iceland
2Institute of Ecology and Earth Sciences, University of Tartu, Lai 40, Tartu S5005, Estonia
3Department of Biological Sciences, University of Alberta T6G 2E9 Edmonton, Canada
4University Centre in Svalbard (UNIS), Longyearbyen N-9137, Norway
5Department of Arctic and Marine Biology, University of Tromsø, Tromsø, N-9037 Norway
6Norwegian Polar Institute, Fram Centre, NO-9296 Tromsø, Norway