Workshop - Tundra bryophytes

Inga, Esther, Signe, Mariana, Marcel, Jeremy, Blandine

Mariana's presentation: Bryophyte and lichen diversity great in the Arctic, and potentially decreasing with vascular plant cover and with warming, which are process that are bound to keep amplifying in the future - thus why it's so important to improve our taxonomic ID of these species

Signe's presentation: Bryophyte Functional Groups. Most important representative group in terms of biomass, increasing diversity towards the high latitudes
Species ID issues
High functional diversity – how do we increase the resolution? By creating morphologically distinct groups and test if they are functionally different
Grouping systems based on life-history traits
BFGs: thallus vs leaves, heavily branched vs sparsely branched, etc.
List of relevant traits: water holding capacity, etc (Grau-Andres et al. 2022)
Use of these groups to classify ITEX data
Little research on how functional traits relate to life history and demography of the mosses

Inga Svala's presentation: current manuscript in prep on climate effects on bryophyte community structure, composition and function (at ITEX sites in two bioclimatic subzones, and five tundra habitats) - different responses to warming in different habitats. Bryophyte cover and layer depth decreased in Betula heath but increased in Cassiope heath in the high Arctic. Bryophyte community composition shifted in Betula heath where Branched turf (BT) BFGs decreased and in a snow bed habitat where BT species increased. Bryophyte traits such as shoot growth and water holding capacity responded differently to warming in different habitats while N2-fixation tended to decrease in all habitats. In summary, the results demonstrate clearly that bryophyte responses to warming have strong implications for ecosystem functioning that differ between tundra habitats, which underlines the importance of addressing bryophyte taxonomic and functional diversity.

Discussion:

How to improve species ID?

- Macro lenses to be able to come back to the photos for ID
- Destructive sampling at sites vs outside - prioritise taking samples from outside
- Design keys for each site to help with ID so there's a clear species list with at least the main species
- Functionally it's good enough
- Trade-off with time: difficult to fit >150 plots with fully identified species
- Define the 'ambition level' that you need: you can identify to genus if enough for a particular project, sometimes you need species level - make diversity calculations – there is more to species diversity than functional groups/species – nested approach

(functional group / genus / species) so we can test different questions for synthesis — Go to genus level if possible and then note whether it belongs to one group or the other
- Recording depth of the moss layer at X points in the pointframe
- Come up with a Google Drive folder where people can share their species keys and lists, and also a directory of people that have some bryophyte knowledge and taxonomists that we now so that people can send samples if needed
- Bryophyte ID course in Lund University (remote, part present in Lund) https://www.biologyeducation.lu.se/education/courses/advanced-level-courses/bryophyte-morphology-and-identification-bior97
- Get students from that course & the other one to do projects and hire them as field assistants or master thesis
- List of training and courses available across different places
- See where the sites fall in terms of hierarchy (Signe & Mariana)
- Voucher specimens?
- Join the bryophyte ID channel at ITEX!
- Continue the discussion offline to chat about further synthesis and which research we want to tackle as a group with ITEX
- Bryolist - ask ID questions and others
- List of species w BFG classification (Signe)
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