



The Polar Crust Project- BSC Diversity and Variability in the Arctic and Antarctica

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The Polar Crust Project is a newly funded DFG initiative that aims to provide a precise evaluation of the biodiversity of eukaryotic green microalgae and cyanobacteria in Biological Soil Crusts (BSC) isolated from the Antarctic Peninsula and Arctic Svalbard. This project will include a thorough investigation into the composition of BSC in the Polar regions, this especially is important for Svalbard due to the severe lack of any previous research on such communities in this area.

During our expedition to Spitsbergen, Svalbard in August 2014 we were particularly surprised to find that the coverage of BSC is extremely high and is certainly the dominant vegetation type around Ny Ålesund. Due to this discovery the project has now been extended to include long term measurements of CO₂ gas exchange in order to gain exact seasonal carbon fixation rates and therefore discovering how the BSC contributes to the ecosystems carbon balance.

The research areas of Spitsbergen were centred around 2 localities: Ny-Ålesund is a research town, home to the AWIPEV station, on the Brøgger peninsula. Longyearbyen, which is the largest settlement on the island, is found in the valley Longyeardalen on the shore of Adventfjorden. Areas where BSC is the prevalent vegetation type were identified, 6 around Ny-Ålesund and 4 for Longyearbyen, and vegetation surveys were conducted. This entailed 625 single point measurements at each site and identifying the crust/or other cover type. For example, green algal lichen, cyanobacterial crust, higher plant, open soil. Samples were also taken at every location in order to study the green algal and cyanobacterial diversity. The vegetation survey will allow us to get a good overview of the BSC composition at the different sites. In January 2015 an expedition to the Antarctic Peninsula took place, here the sampling method was repeated and therefore both Polar Regions BSC composition can be described and compared.

Here, we wish to introduce the Polar Crust Project and present the results of the vegetation study to date. This should provide a general overview of what we hope to be a very interesting and important project in the further understanding of Polar BSC and how they stand to cope and/or change in the face of global warming.