

3.2. Botany and Plant Physiology

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Botanical group (Fig.3.2.1.) focused on two projects:

1. Assessment and analysis of plant functional traits
2. A role of cushion plant *Silene acaulis* in spatial arrangement of plant communities



Fig. 3.2.1. The botanical group and part of the zoology group just before departure to Svalbard at Prague airport.

Assessment and analysis of plant functional traits

During field course we continued the sampling of plant functional traits, which we already started in previous years. This year we focused on leaf traits. Plants growing in beneficial conditions with enough of moisture and nutrients and in environment of mild climate have fast growth, i.e. high specific leaf area (area per unit of leaf weight), short lifespan of leaves, palatable and easily decomposable leaves as they have favorable nutrient composition of leaves. On the other hand plants inhabiting Svalbard are not growing in favorable conditions and thus we can expect that their leaves will have lower specific leaf area, longer lifespan, and they will not be palatable and easily decomposable as they nutrient composition will not be as favorable for decomposers as plants from warmer zones. We first measure specific leaf area, the trait which is fundamental for understanding a strategy of plant growth in relation to productivity of a substrate. Our results supported theoretical expectations, our plants from Svalbard (cca 70 species) have lower specific leaf area than plants belonging to the same genera but growing in continental Europe (Fig. 3.2.2.). We continue with further analyses of the dataset.

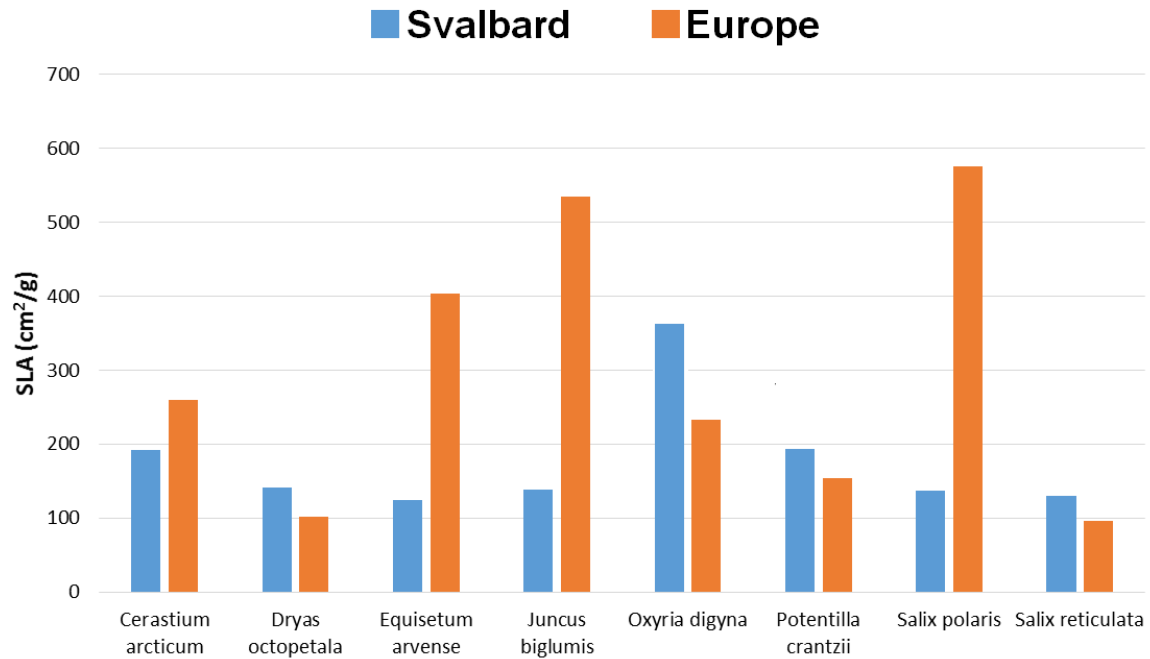


Fig. 3.2.2. Comparison of specific leaf area (SLA) in selected species growing in both, Svalbard and continental Europe.

Silene acaulis in spatial arrangement of plant communities

Cushion plants are famous ecosystem engineers as they affect by their growth environmental conditions in a community. As the cushion growth form occurred preferentially in stressful environments, for example affected by frost or dryness, it may be beneficial for other plants to growth inside of cushion plant than outside of it. So far researches mainly report the cases that there are more favorable environmental conditions inside of cushion and that plants of the community prefer to growth inside of it, studies from high Arctic are, however, very rare. In our project we studied whether in community with cushion plant *Silene acaulis* (Fig. 3.2.3.) are some species which prefer to growth inside of cushion than outside and whether environmental conditions in the cushions differ from surrounding. From our measurements follows that inside



Fig. 3.2.3. Does the cushion environment of *Silene acaulis* facilitate growth of other plant species?

of cushion of studied species there is higher temperature, lower moisture and deeper substrate than outside of it. However, most importantly, less ramets and less species grow inside the cushions, i.e. *Silene acaulis* does not facilitate the establishment and/or grow of other plants.