Variation in plant reproductive success on an early-successional outwash plain

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With its nutrient deficient substrate, poor water-holding capacity and scouring sandstorms, the outwash plain of Skeiðarársandur SE Iceland is a challenging environment for plants. Additionally, Skeiðarársandur is regularly subjected to massive glacial floods (*jökulhlaups*). These may break ice blocks from the margin of Skeiðarárjökull glacier and deposit them on the sandur, creating a pitted landscape of kettleholes (*jökulker*); circular depressions that may be several metres deep and range in surface width from ca 5 – 25 m. The kettleholes create topographical variation in the otherwise relatively homogeneous sandur surface. The easternmost part of Skeiðarársandur has been protected from jökulhlaups for over 30 yrs and is by now successionally more advanced than most of the sandur, probably reflecting the combined benefits of a more stable environment and proximity to the species-rich seed pool of Skaftafell National Park.

One approach to exploring the significance of environmental variation for plant establishment and vegetation succession across the plain, is to compare plant performance (growth and/or reproduction) in different sites. Here, we present a study that compares the reproductive effort and reproductive success of two common species on Skeiðarársandur; three-leaved rush *Juncus trifidus* and alpine lady's mantle *Alcemilla alpina* in three contrasting habitats on the sand: the relatively stable dike-protected areas close to the National Park (habitat 1), ca 5 km SSE from Skeiðarárjökull glacier margin, and inside (habitat 2) and outside kettleholes (habitat 3) ca 2 km S of Skeiðarárjökull close to the E-W centre of the sand. In September 2005, above-ground biomass was harvested and the following variables measured or counted: plant size (diameter), number of flowering shoots, number of fruits, number of aborted, immature and mature seeds per fruit and incidence of predation. Seed viability and germination rate will be assessed in germination trials.

Preliminary results indicate that the number of ovules/fruit in *Juncus trifidus* differed among the three habitats. Ovule predation was heavy in habitat 1 (>25% of fruit) but this was the only population to produce appreciable number of mature seeds (>50% of ovules). In the other two habitats, most ovules were classified as aborted (70-90%) or unfertilized (8 – 26%) and very few developed into mature seeds; 2.9% within kettleholes (habitat 2) and only 0.3% in on the adjacent flats (habitat 3).