

## **Assessing the impact of glacier retreat on biodiversity and plant–insect interaction dynamics**

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The retreat and extinction of glaciers worldwide is followed by the loss of plant and insect species from ecological networks and local communities. Furthermore, due to glacier retreat, new plant and insect species are moving up to higher altitude, causing changes in species diversity, species composition and also in plant-insect interactions. An integrative understanding of network dynamics and ecosystem functions following glacier retreat is therefore of major importance to biodiversity maintenance and environmental health. At Mont Miné glacier, Swiss Alps, we reconstructed the retreat of glacier during the last two centuries using geochronology and addressed four main stages of deglaciation ranging from recently ice-free terrains to late stages of development since the end of the Little Ice Age (c 1864). Following this glacier retreat gradient, we surveyed plants and pollinator insects to investigate the structure and dynamic of pollination networks and unveil their assembly by means of network analysis. We observed sharp changes in biodiversity of both plants and pollinators following glacier retreat. Communities close to the glacier are characterized by pioneer plant species characteristic of glacier environments but pollinator species from lowland. We found an increase in the abundance and richness of interactions shortly after glacier retreat. Yet, the complexity of pollination network decreased in late stages a century after the retreat of glacier. These results indicate that, in the long-term, glacier retreat can decrease the diversity and stability of ecological networks.