

Flower color diversity in ecological communities: a case study in alpine grassland communities

Roberto Rebollo¹, Pengjuan Zu¹

¹Department of Environmental Systems Science, ETH Zurich, Zurich, Switzerland.

Abstract:

Flowers exhibit an astonishing diversity of colors, which play important ecological roles such as attracting suitable pollinators. Studies started to document patterns of color diversity in various ecological communities. However, we still lack a mechanistic understanding of why communities harbor such a high diversity of flower colors.

In this study, we focus on alpine grassland communities, that are known for their diversity of flowering species. We have measured flower color reflectance (using a spectrophotometer) for 65 plant species and gathered similar color data for 74 alpine species from the literature. These plant species can be categorized into communities based on their occurrence in typical phytosociological units.

By sampling random subsets of species belonging to either described communities or to the whole set of species, and calculating diversity measures, we ask whether observed alpine flower communities show higher color diversity than expected by chance (while controlling for the phylogeny of sampled species), and whether pollinator-mediated niche-partitioning may explain the high-color diversity in plants occurring in the same community.

Our preliminary results suggested that the colors are more diverse in observed communities than expected by chance. We are currently analyzing the data to answer the other question. Overall, we expect this work will bring novel insights for a better understanding on color diversity in plant communities.