Title: Effects of local and landscape factors on pollinator genetic diversity and differentiation

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Abstract:

Of the many alterations to natural ecosystems brought on by human impacts, land-use change is among the strongest drivers of biodiversity change. With a growing population size, maintaining stable ecosystem services while ensuring global food production is proving to be a major challenge. Despite the importance of natural and semi-natural habitats to insect pollinators (and biodiversity as a whole), in agricultural landscapes, these remaining areas are often highly fragmented and degraded. With an increasing number of studies revealing negative impacts of habitat fragmentation and isolation on pollinators, there is an urgent need for the proper identification of risk indicators to ensure effective implementation of conservation and restoration efforts. However, critical knowledge gaps remain regarding the relative importance of various local and landscape factors, and their interactions with protected habitats. Here, we use a systemic approach considering independent gradients in local (e.g., patch size) and landscape factors (e.g., composition, configuration, connectivity) to examine their effects on genetic diversity and population structure in wild bees. We sampled wild bees in 30 protected dry calcareous grasslands embedded in agricultural landscapes in Switzerland. Next, we will use Double digest Restriction-site Associated DNA sequencing (ddRADseq) to measure genetic diversity and population structure in select wild bee species, and will assess the influence of the factors driving pollinator genetics. Data on flowering plant and pollinator communities (bees, hoverflies, butterflies), and their interaction networks will additionally be analysed to improve our understanding habitat dynamics in protected calcareous grasslands, as a prerequisite for effective conservation management and policy.