

Title

**Abundant generalist pollinators prevent a rapid decline in interaction diversity upon landscape simplification**

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Abstract

Landscape simplification is considered a major factor in reported declines in plant and pollinator diversity in agroecosystems. Most flowering plant species benefit from animal pollination, whereas pollinators are dependent on floral resources. However, it is barely investigated how landscape simplification affects the diversity of plant-pollinator interactions. It may not only depend on the cascading effects of altered plant and pollinator diversity but also on changes in interaction structure, such as altered diet generalisations of interacting species, with implications for network stability and functioning. We therefore analysed the flower-visitation networks (focusing on bees and hoverflies) of 24 agricultural landscapes along gradients of landscape simplification in France, Germany, and Switzerland. We assessed the impact of landscape simplification on species and interaction diversity, as well as the robustness of the plant-pollinator networks. We found that interaction diversity decreased at a similar rate as pollinator species diversity along the landscape simplification gradient. The decrease in interaction diversity was buffered by the persistence of abundant, well-linked generalist pollinators in simplified landscapes, which resulted in pollinator communities in simplified landscapes being nested subsets of communities in complex landscapes. Regardless of landscape

simplification, the presence of a few highly abundant pollinators made the networks very robust against predicted loss of visited plant species from the network due to pollinator loss. This was primarily due to the nested network structure through which these dominant pollinators also visited rather poorly linked plant species in all landscapes, thereby likely providing an important insurance function for pollination services in simplified landscapes.