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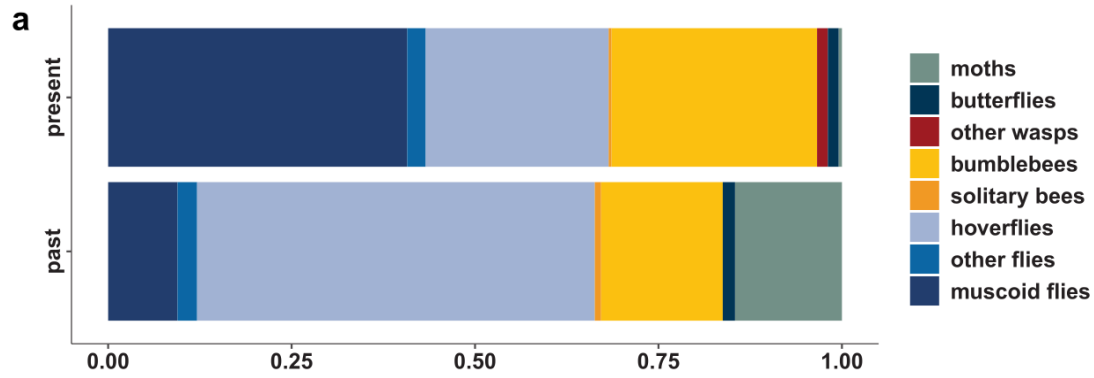
Historical data and modern science

Animal pollination is an essential ecosystem service, as approximately half of the world's plants would have near complete reproductive failure in the absence of pollinators. Pollinators are increasingly under threat due to climate and land use change, and it is critical to understand how temporal changes affect the structure and function of plant-pollinator interactions. Because the responses of plant-pollinators interactions to anthropogenic change may take place over decades, historical collections that store information across long time horizons contribute uniquely to our understanding. In this talk, the findings from three studies are presented that use historical collections combined with modern resampling to examine changes in plant-pollinator interactions.

In the USA, Charles Robinson collected data on bees visiting flowering plants in Carlinville, Illinois from 1887-1899. Modern resampling indicated that nearly half the bees in the system went locally extinct, and that these extinctions are non-random, with certain clades of species being more vulnerable. In subarctic Finland and in the Swiss and Italian Alps, resampling of datasets collected by Frans Silén and Hermann Müller, also in the late 1800s, revealed declines in the abundance of moth and butterfly pollinators and increasing roles of more generalized flies. This talk illustrates how natural history collections can be used to answer outstanding questions regarding changes in plant-pollinator interactions.

Tiffany Knight and Laura Burkle observing the insect collection of Charles Robinson at the Illinois Natural History Survey.



Change in the relative abundance of different groups of pollinating insects visiting the same plant species in the late 1800s and in modern times in Finland. Zoller et al. in press. Nature Ecology and Evolution.

Team of scientists collecting data in the Italian Alps at the same field sites sampled by Hermann Müller in the late 1800s.