Predicting the Resistance of Plant-Pollinator Assemblages to Fire

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Presentation Description:

Nearly every ecosystem on earth experiences some form of natural or human induced disturbance. Given that the scale and frequency of disturbances continue to increase, it is important to understand what attributes of community assemblages lead to resistance. While past research has compared pre- and post-disturbance communities using a space for time substitution, few have tracked the flora and fauna of individual sites as they experience and recover from disturbance. We measured how disturbance reshapes the architecture of interactions within a bipartite network using a combination of a before-after control impact (BACI) study design and network analysis. We studied plant-pollinator interactions in a northern Californian oak woodland disturbed by wildfire. Studying this system is particularly relevant given the increasing size and intensity of wildfires in Mediterranean ecosystems and the importance of plant-pollinator interactions in these systems. We assessed how fire changes community composition, what species traits fire selects for, and how disturbance impacts network structure. We also tested whether we could predict which sites would be most resistant to disturbance based on historic data. As expected, we found that fire led to increased generality and associated network metrics as well as changes in species composition. We also found that pre-disturbance bee abundance and species richness strongly predicted resistance while the network structure was less relevant. Our findings highlight the urgency of supporting wild bee communities and provide a model for evaluating habitats prior to substantial disturbance in order to predict resistance.