IMPACT OF DISTINCT INSECT POLLINATORS ON GENE FLOW. Johanne Brunet and Karsten G. Holmquist, research ecologist and postdoctoral associate, United States Department of Agriculture, Agricultural Research System, Vegetable Crops Research Unit, University of Wisconsin, Madison, WI 53706.

The vast majority of fruits and vegetables, together with some hay crops (alfalfa) and some oil-producing crops (canola) are pollinated by insects. However we have little information on how insect pollinators affect the movement of genes via pollen and even less on how distinct insect pollinators may differentially affect pollen flow. In this study we examined whether two types of insect pollinators, bumble bees and hawkmoths, differentially affected gene flow via pollen in the rocky mountain columbine, our model system. In one experiment, we used paternity analyses to contrast the movement of genes via pollen by bumble bees and hawkmoths within and between patches within a population. In a second experiment, we genotyped seeds from many target females located within a 40 km^2 area, and used the Kindist module of Poldisp v.1.0 to fit the exponential power model to the haplotype data in order to calculate the average distance, axial variance and kurtosis of pollen dispersal for each pollination treatment. Both pollinator types were as efficient at moving pollen around (male function). In addition both pollinator types visited the same number of females and each female received similar progeny diversity whether pollen was carried by hawkmoths or by bumble bees. Moreover bumble bees did not limit their movement to nearest neighbor plants but frequently moved pollen among patches. On a larger geographical scale, dusk and night flying pollinators (hawkmoths) moved pollen 2-5 X as far as day flying pollinators (bumble bees). Pollen dispersal was fat tailed with relatively high kurtosis indicating the importance of long distance gene dispersal.