



Effects of plant distribution on the foraging behavior of pollinators

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Introduction

- ❖ Plants need to receive pollen of their same species in order to make seeds. Pollen of the same species as that of the focal plant is called conspecific pollen. When pollinators transfer pollen between different species of plants they are transferring heterospecific pollen. Heterospecific pollen receipt can reduce the amount of seeds a plant produces.
- ❖ We studied if the proportion of conspecific pollen carried by pollinators differs between urban sites and natural sites in the Bay Area. We found that pollinators from urban sites carried higher proportions of conspecific pollen (Figure 1).
- ❖ We are currently investigating if the distribution of plant species could be responsible for the higher conspecific pollen proportions on bees in urban areas. **Specifically, we are asking if plants are more clumped in urban or natural areas.**

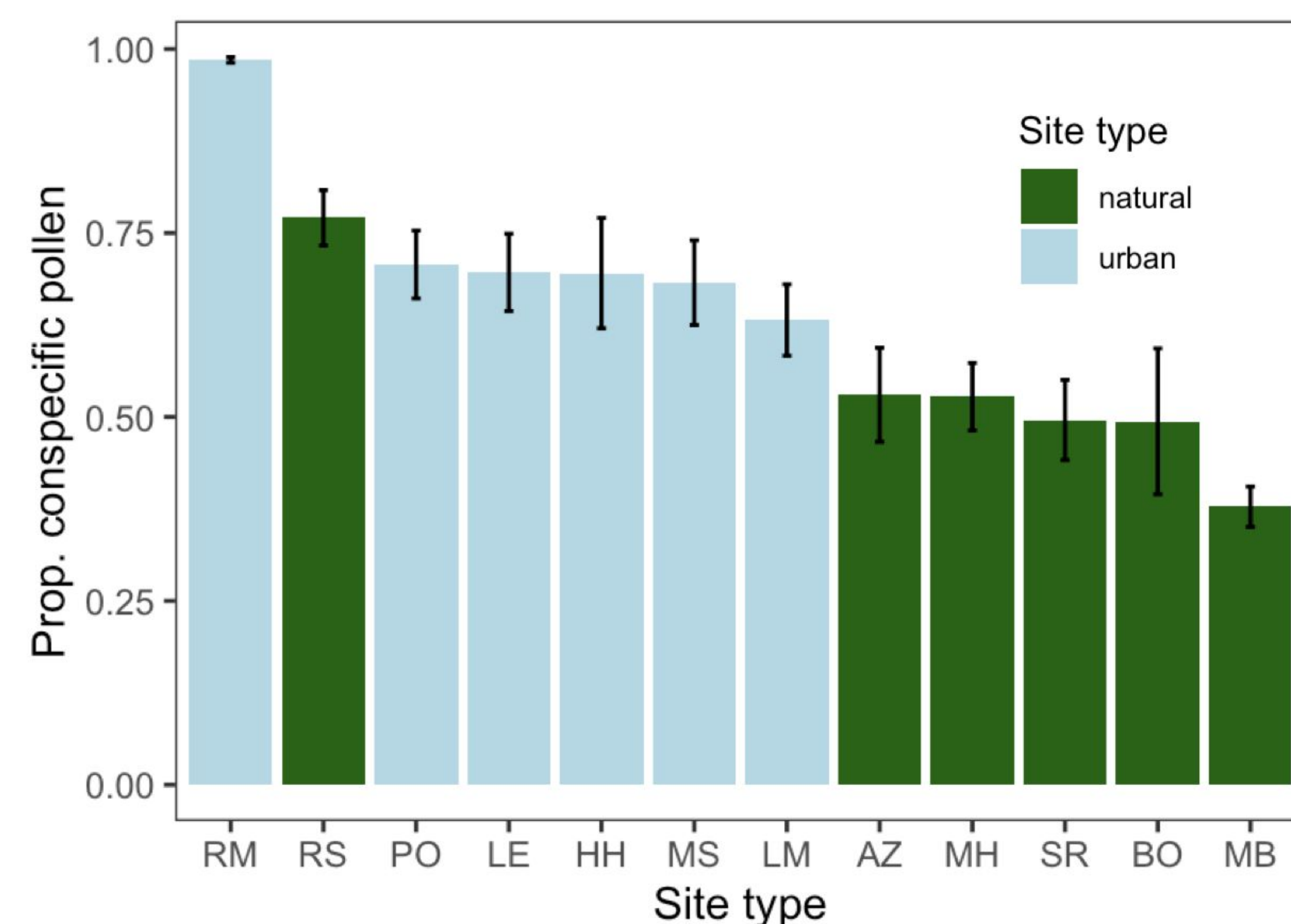


Figure 1. The average proportion of pollen carried by pollinators that was from the same plant species as the one on which the pollinator was caught. Error bars depict standard errors.

Methods

- ❖ We will determine the species of the nearest neighbor of plants along 90 M transects at six urban and six natural sites throughout the Bay Area. Field work will occur between 1:30 and 3:30 in the afternoon when there is predicted to be a maximum amount of sun and flowers appear to be in anthesis.
- ❖ At each site, we will sample all flowers within 15 cm of transect tapes. The transect tape will be placed randomly throughout the plot of land.
- ❖ We will determine if plants are more clumped in urban sites than natural sites by estimating the proportion of plants whose nearest neighbor was their same species and comparing between site types, urban and natural.
- ❖ We will use a linear mixed model with the proportion of plants whose nearest neighbor was the same species as the dependent variable, site type as the independent variable, and site as a random factor.

Expected results & Conclusions

- ❖ We hypothesize that because the proportion of conspecific pollen has shown to be higher in urban sites, we would expect plants to be more clumped in urban areas than in natural areas.
- ❖ Our hypothesis is based on Optimal Foraging Theory (Pyke 1984), which states that animals will maximize energy gain while minimizing energy expenditure. Based on this theory, we would expect plants to be more clumped in urban areas than in natural areas.
- ❖ We anticipate that if our results support our hypothesis, we can assume that pollinators are foraging between closely clumped plant species. However, if our results do not align with our hypothesis, further investigation is necessary to identify why pollinators had more conspecific pollen in urban areas.

