Hymenopteran Pollinator Community Structure in a Desert Metropolis

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Agapostemon on nightshade

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Apis mellifera on tansy aster

Pollination & Pollinators in the Sonoran Desert

- a center of global pollinator diversity
- unknown response to urbanization
- economically vital
- ecologically vital (keystone species)

Apis mellifera on brittlebush

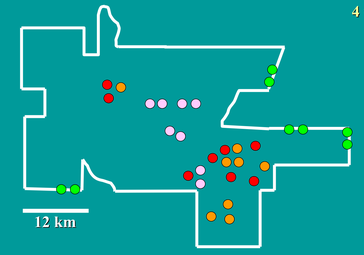
Research Questions

- How does pollinator diversity vary with urban land use and urban location?
- How does pollinatory diversity vary with residential horticultural practices (mesiscaping vs. xeriscaping)?

Honeybee (*Apis mellifera*)

- paired blue and yellow plastic bowls
- filled with 200 ml water and 2 drops liquid soap
- 2 pairs per site
- bowls left out for 36 hrs in autumn 1998 & in spring 1999
- passive, inexpensive

Methods: Study Sites



4 water traps at each:

- xeriscaped residential
- mesiscaped residential
- urban desert remnant
- fringe desert

Methods: Site Types

The following habitat features were measured in a 20-m circle centered around each site:

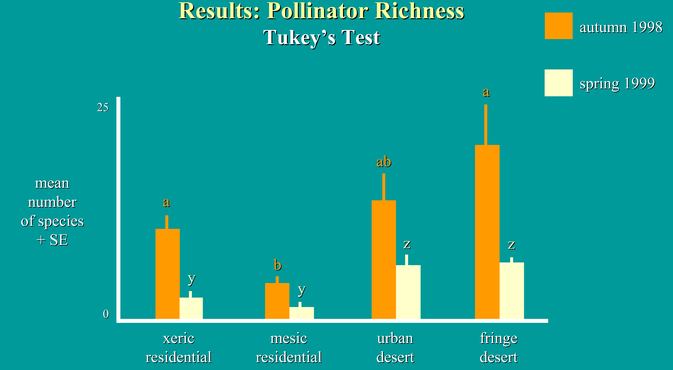
- percent ground cover of bare ground, gravel, and lawn
- number of trees, shrubs, cacti, herbaceous plants, and built structures

Methods: Analyses

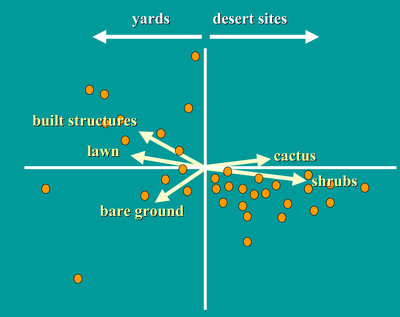
- diversity by land-use type: analysis of variance, followed by Tukey's test
- effect of habitat features on community composition: canonical correspondence analysis

Megachile on cereus

Results: Pollinator Richness
Tukey's Test



Results: Community Composition
Canonical Correspondence Analysis



Ordination diagram: points represent abundances of 36 species, arrows represent habitat features. Data shown are from autumn 1998. The location of a point relative to an arrow indicates the habitat features associated with that point. Arrow length indicates importance of the habitat variable to overall model fit. The angle between arrows indicates correlation between variables (small angle = high correlation).

The vertical axis functionally separates residential sites from desert ones. Slightly more species are associated with desert sites than with residential yards. The abundances of cactus and shrubs at desert sites, and the amount of bare ground, lawn, and buildings in yards, appear to be the habitat features that are most influential on pollinator abundance.

Recommendations for Pollinator Conservation

- preserve areas of desert outside the metro area
- xeriscaping preferred over mesiscaping