



Does Flower Morphology affect Honey Bee Preference?

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Abstract

- Considering honey bee populations are at threat of declining (1), flower preference is important to understand how we can attempt to preserve their habitats.
- The difference in abundance and time spent on composite vs non composite flowers is important to know in order to conserve habitats, and since bees are important for helping flowers and plants reproduce (2).
- Will composite flowers have more honey bees than non composite flowers?
- Composite flowers had significantly more honey bees than non composite flowers and the honey bees tended to stay longer as well.
- With more knowledge on flower preference we can take steps to restore habitats for honey bees, and improve agriculture.

Purpose

The purpose of this research is to gain a better understanding of flower preference in honey bees in order to maintain their habitats.

Questions, Hypotheses, and Predictions

Question: Do honey bees prefer composite flowers?

Hypothesis: Honey bees prefer composite flowers.

Prediction: Honey bees prefer composite flowers and will spend more time on them.

Study System

Honey bees tend to live in gardens, orchards, meadows, or anywhere with flowering plants, they are native to Europe, Middle East, and Africa. Honey bees are eusocial and live in cooperative colonies. The honey bees I looked at were at the KSU gardens.

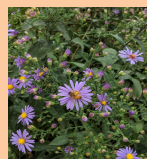


Fig. 1a: *Symphyotrichum leave*(comp.)

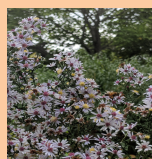


Fig. 2a: *Symphyotrichum oolentangiense*(comp.)



Fig. 1c: *Rosa europeana*(non comp.)



Fig. 1d: *Petunia atkinsiana*(non comp.)

Methods and Experimental Design

- I recorded honey bee abundance and visitation time on four different plant species (Fig 1).
- Symphyotrichum leave*(comp.)
- Symphyotrichum oolentangiense*(comp.)
- Rosa europeana*(non comp.)
- Petunia atkinsiana*(non comp.)
- For each plant species, visitation time was measured for 15 minutes on three different days.
- I counted the number of bee individuals at 5 minute, 10 minute, 15 minute intervals.
- I ran ANOVAS and Tukey tests for honey bee abundance and visitation time in response to plant species.

Results

1. Honey bees preferred composite flowers.

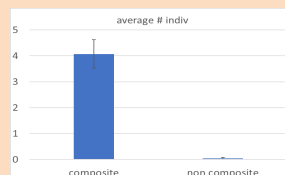


Fig. 2a: More bee individuals on composite flowers.

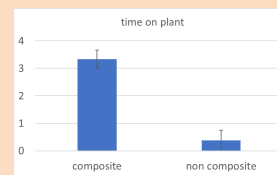


Fig. 2b: Bees spent more time on composite flowers.

2. Honey bee preference varied with plant species.

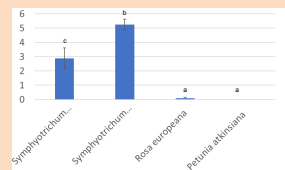


Fig. 2c: More bees on *Symphyotrichum leave*.

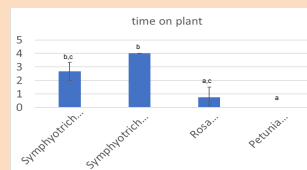


Fig. 2d: Bees spent less time on *Petunia atkinsiana*.

Conclusions

Flower color could have played a role in flower preference. Honey bees see blue and purple colors better which could explain why there weren't many bees on the orange rose (3). Honey bees prefer composite flowers because they are easier to extract resources from, unlike non composite flowers (4). Composite flowers were more abundant, therefore decreasing the bees handling and travel time (4).

Future Directions

- Look at different plant species in different locations.
- Track bee individuals to get better data on abundance.
- Look at other variable such as:
 - Color differences in flower species
 - Differences in plant height
 - Different pollinator species on the plant (competition)
 - Difference in distance between plant species



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