



# Does Flower Morphology affect Honey Bee Preference?

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## Abstract

- Honey bee populations are at threat of declining (1) and flower preference is important to understand in attempts to preserve their habitats and increase population sizes.
- Bees are important mutualists for many flowering plants which pollinate plants in exchange for pollen and nectar resources (2)
- Preference for certain plant types based on morphology has been observed (3) and might be indicative of plant quality
- 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 (*Apis mellifera*) are generalist pollinators and 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.
- I observed honey bees at the KSU gardens (Manhattan, KSU)



## Methods and Experimental Design

- I recorded honey bee abundance and visitation time on four different plant species.



*Symphyotrichum leave* (SYMLAE) (composite)



*Symphyotrichum oolentangiense* (SYMOOL) (composite)



*Rosa europaea* ROSEUR (non composite)

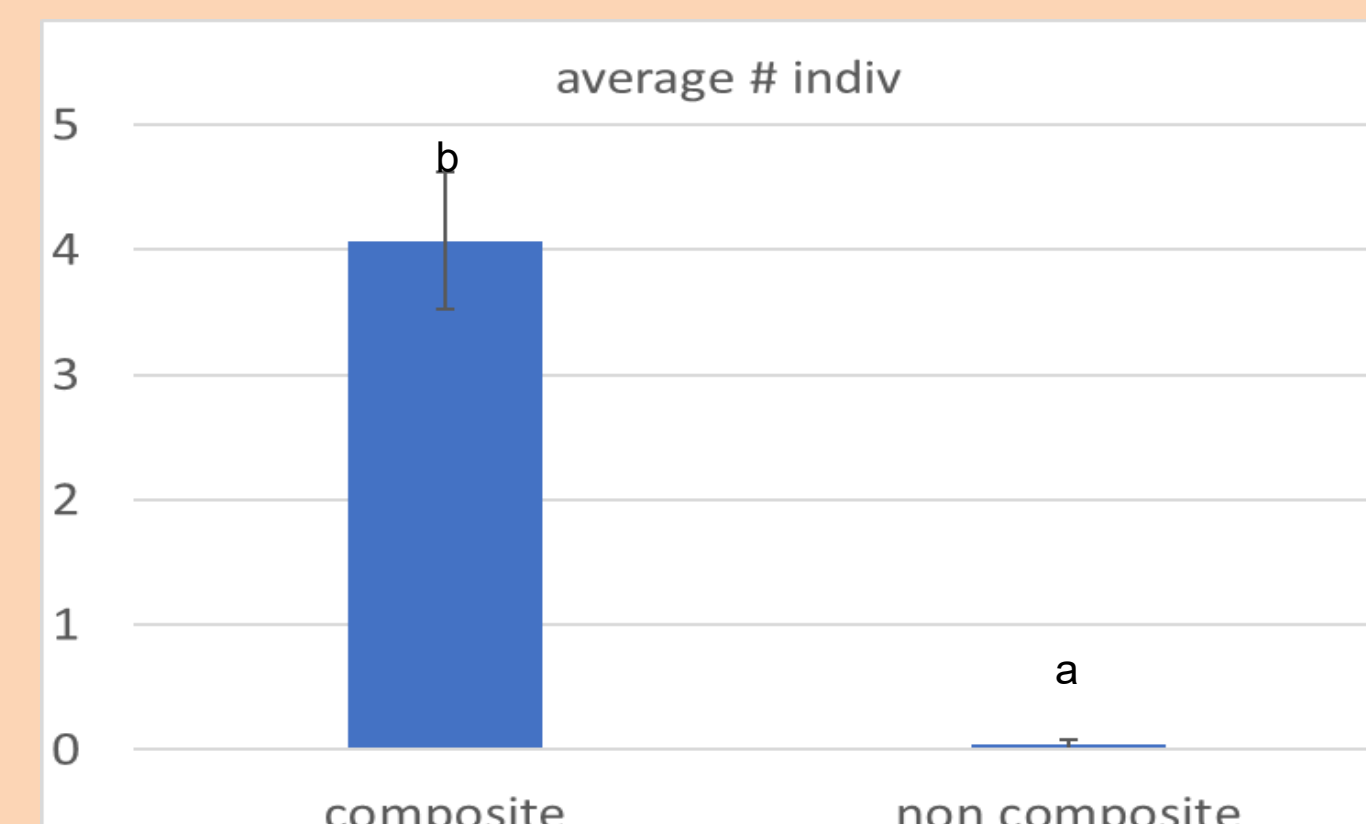


*Petunia atkinsiana* PETATK (non composite)

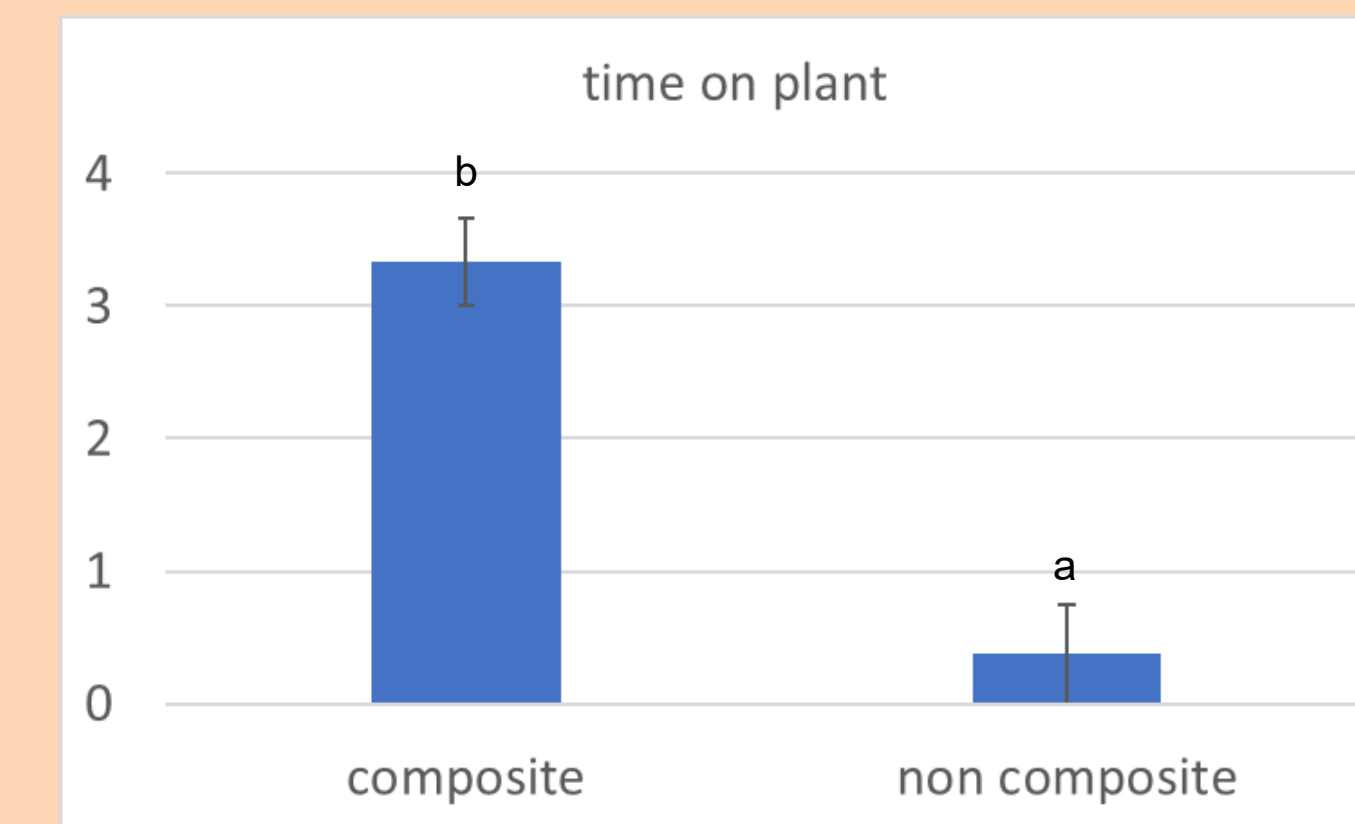
- For each plant species, visitation time was measured for 15 minutes on three different days.
- I counted the number of bee individuals at 5 minute, 10 minute, 15 minute intervals.
- I ran ANOVAS and Tukey tests for honey bee abundance and visitation time in response to plant species.

## Results

Honey bees preferred composite flowers ( $P < 0.01$ )

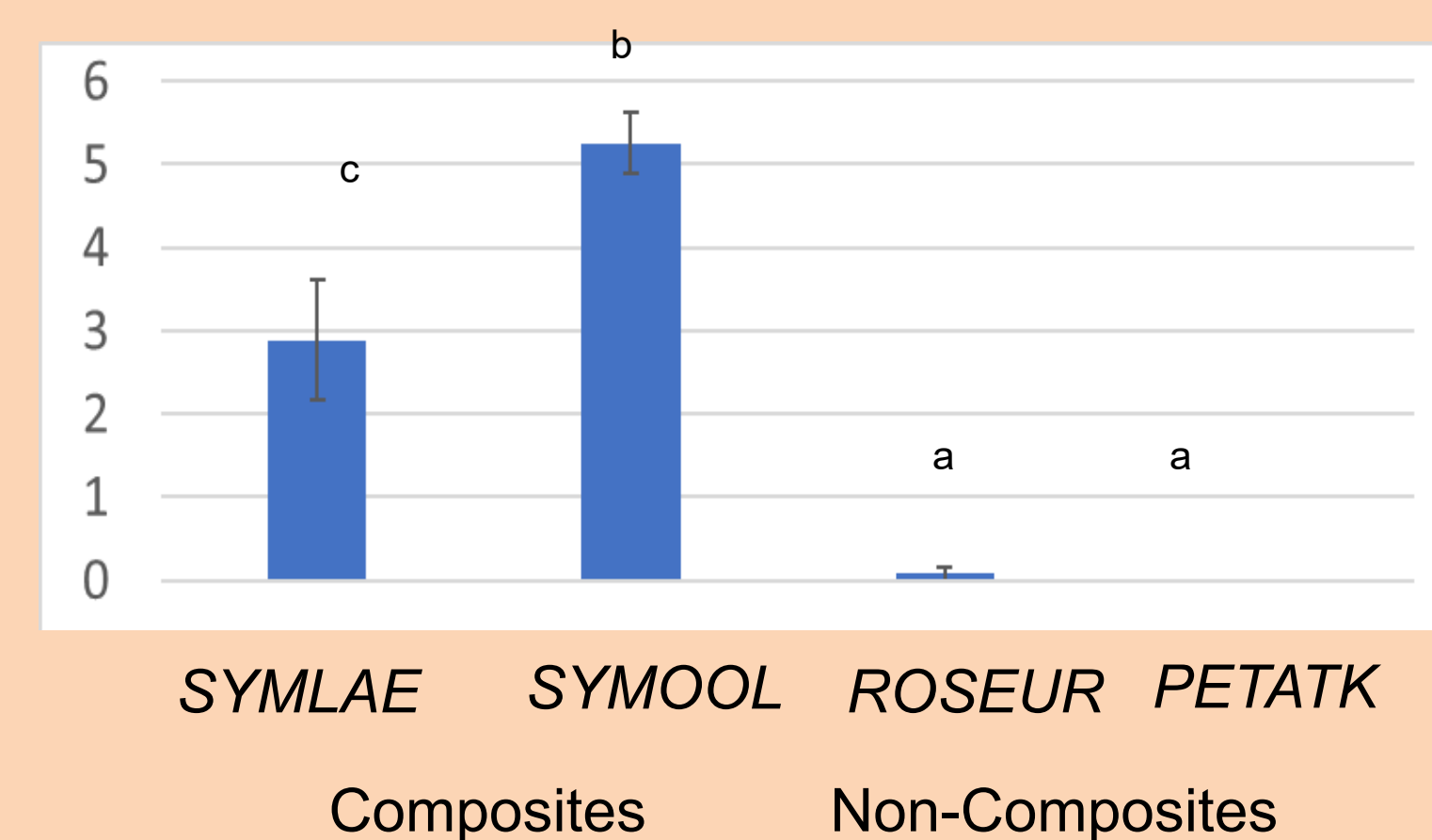


More bee individuals on composite flowers.

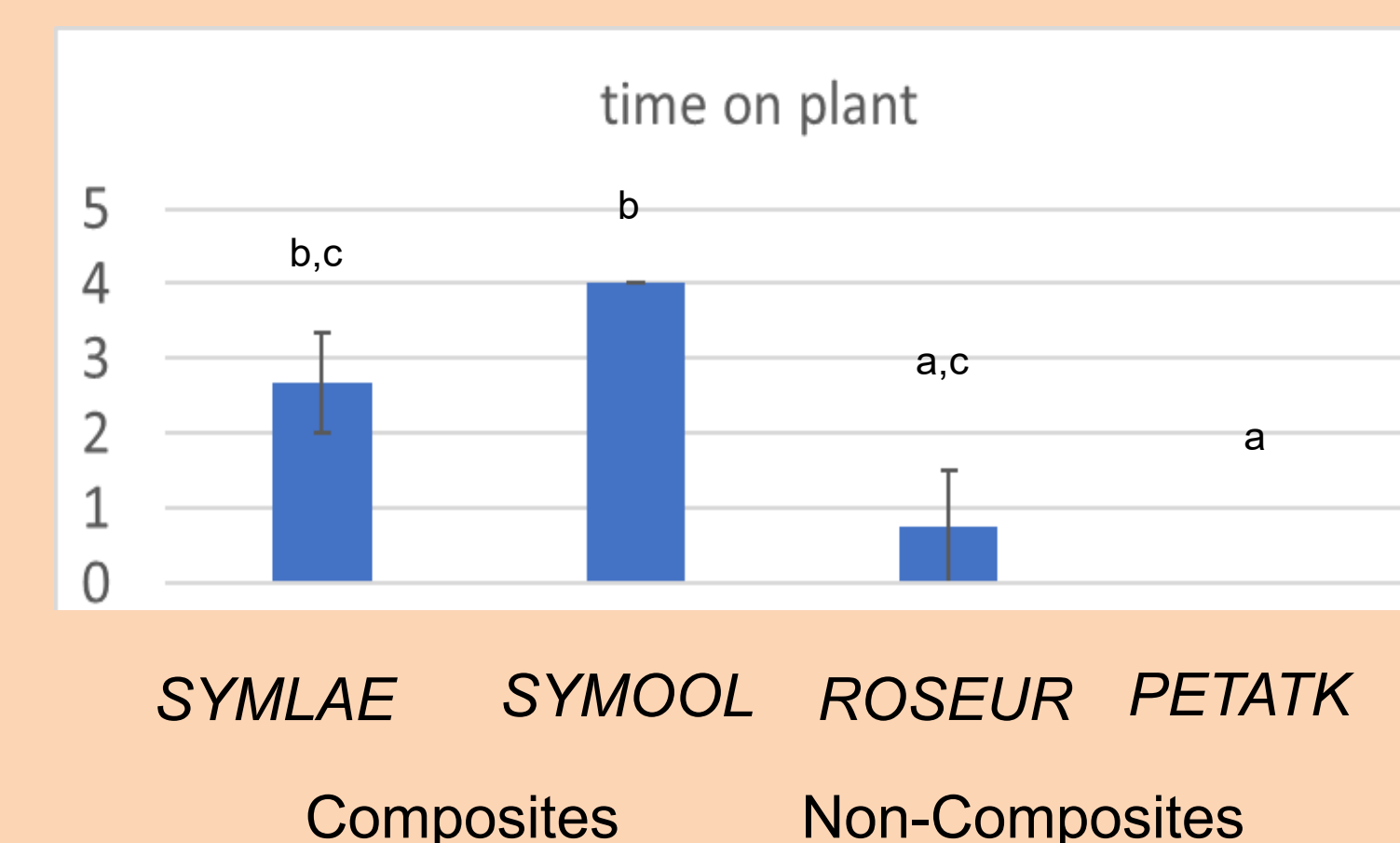


Bees spent more time on composite flowers.

Honey bee preference varied with plant species ( $P = 0.03$ )



More bees on *Symphyotrichum oolentangiense*



Bees spent less time on *Petunia atkinsiana*.

## Conclusions

Honey bees prefer composite flowers. One reason could be that composites are easier to extract resources from, unlike non composite flowers (4).

Composite flowers were also more abundant, therefore preference could be because of decreased bees handling and travel time (4).

Flower color could have played a role in flower preference as composites were also blue/purple.

Honey bees see blue and purple colors better which could explain why there weren't many bees on the orange rose (3).

## Future Directions

Future studies should examine different plant species in different locations.

Tracking bee individuals might get better data on bee abundance.

Other important variables that might affect visitation are:

- Color differences in flower species
- Differences in plant height
- Different pollinator species on the plant (competition)
- Difference in distance between plant species



## References

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