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# THE CONNECTION BETWEEN MITE-BITING AND FLIGHT PERFORMANCE

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## Introduction

- The western honeybee (*Apis mellifera*) is a critical component within the pollination cycle.

Morfin, N., et. al, (2023). *Frontiers in Bee Science*, 1. <https://doi.org/10.3389/frbee.2023.1272937>





## Introduction

- *Varroa mite (Varroa destructor)* poses as one of the most significant threats.



Aldea, P., & Bozinovic, F., <https://link.springer.com/article/10.1007/s13592-020-00777-y#citeas>  
Grindrod, I., & Martin, S., <https://link.springer.com/article/10.1007/s13592-022-00977-8>



# RESEARCH QUESTIONS

- What is the relationship between mite prevalence and flight ability?
- What indirect consequences occur due to the correlation between Varroa and flight performance?

Colonies exhibiting high mite-biting would demonstrate greater flight performance values.

HYPOTHESIS



# Methodology

## Mite Observation

- Examined over 1,000 mites under a microscope.
- Calculated percentage of damaged mites per colony.

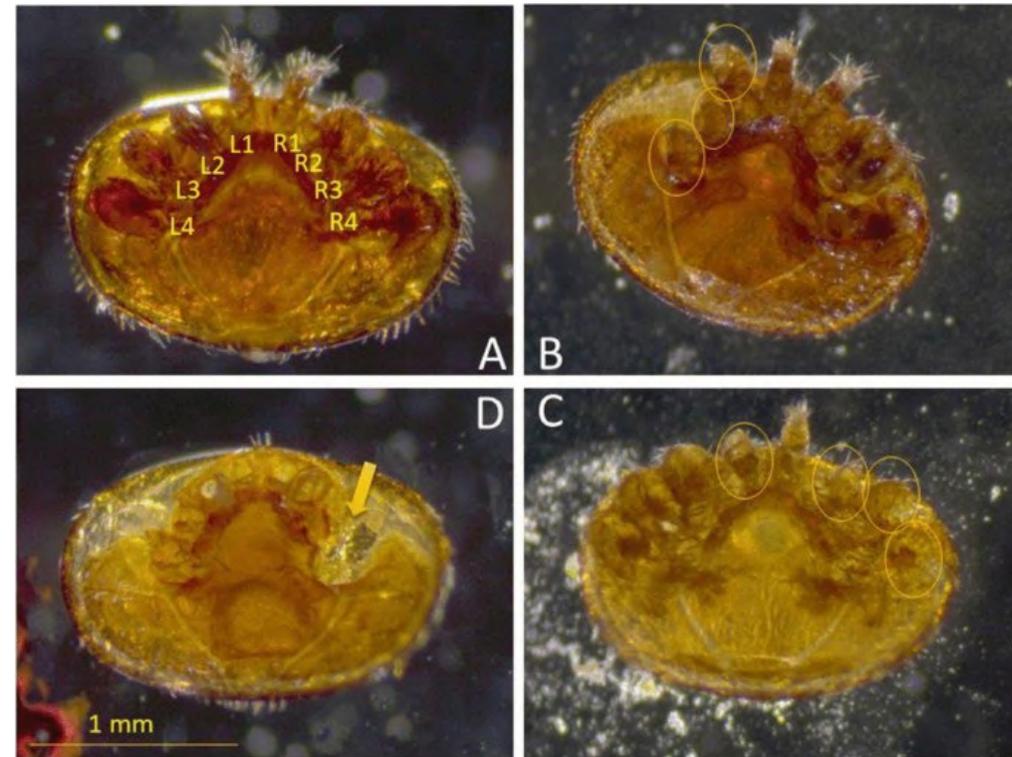
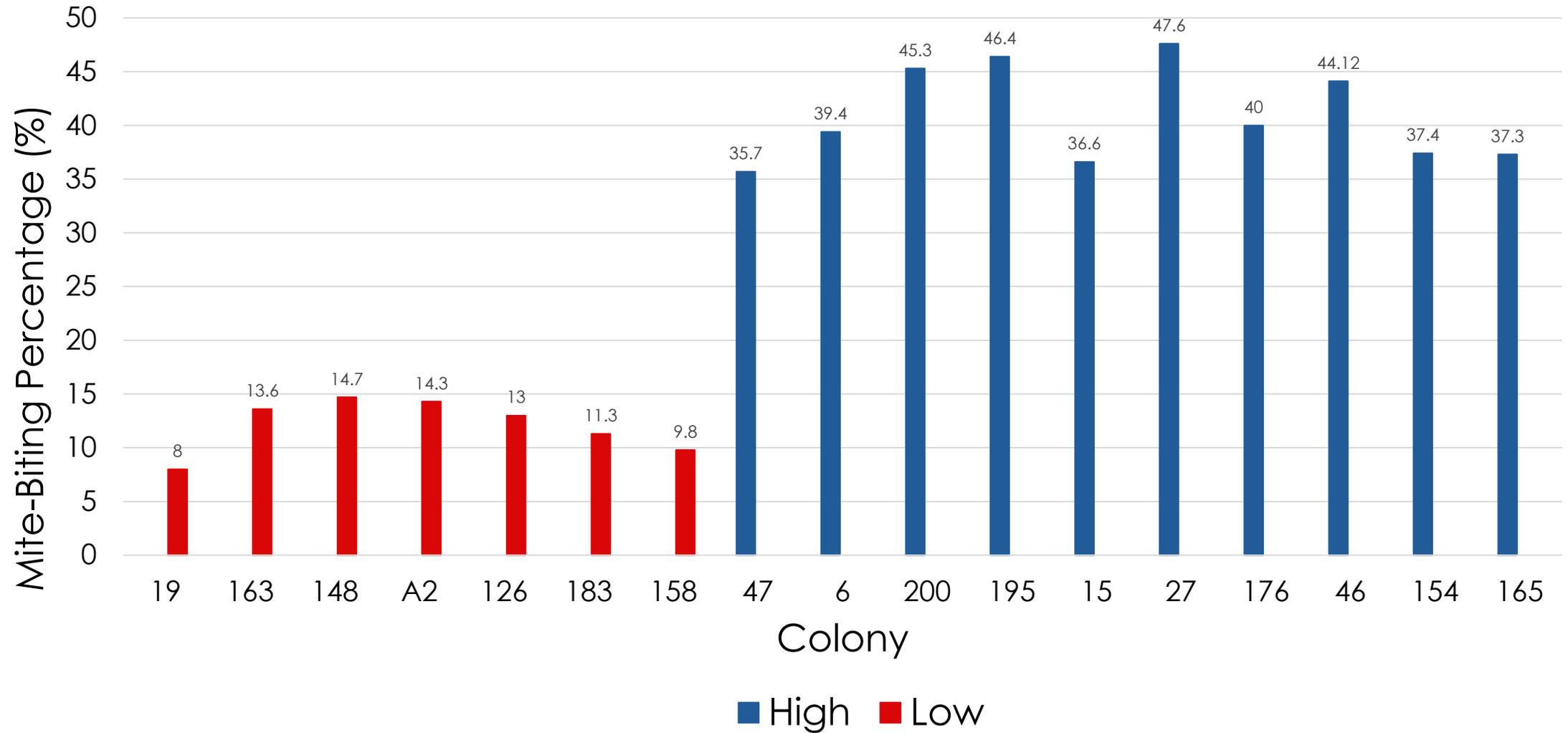


Fig. 1 Mature female mite fully intact (A); damaged mites missing legs (B, C); mature mite with body part removed (D). Li-Byarlay et al., 2025. *Apidologie* 56 (1), 3.



## Mite-Biting Percentage of Breeding Colonies



## Mite Observation Data Analysis

	Mite-biting %
High biting ( $\bar{x}$ )	40.058
Low biting ( $\bar{x}$ )	15.2287
F (1, 18) statistic	129.843
p-value	0.001

## METHODOLOGY

- Collected brood frames for flight mill
- Marked the bees



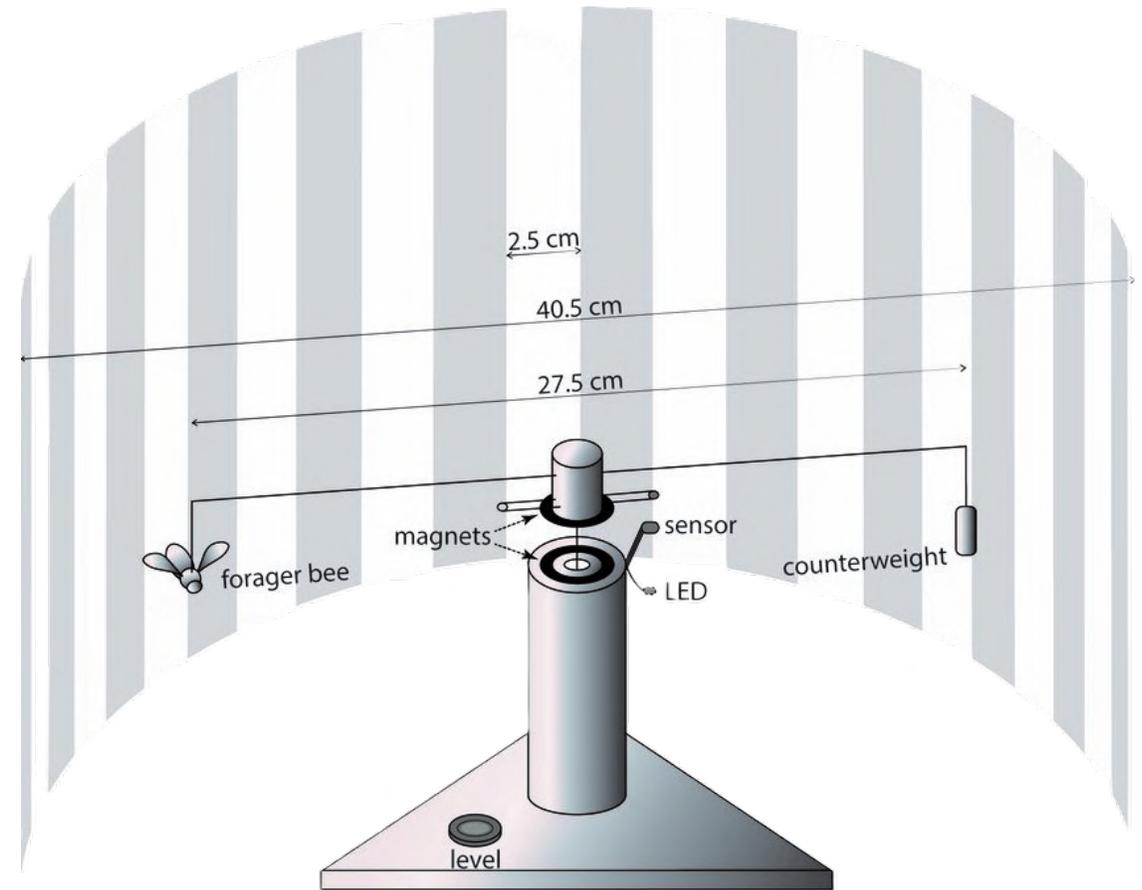
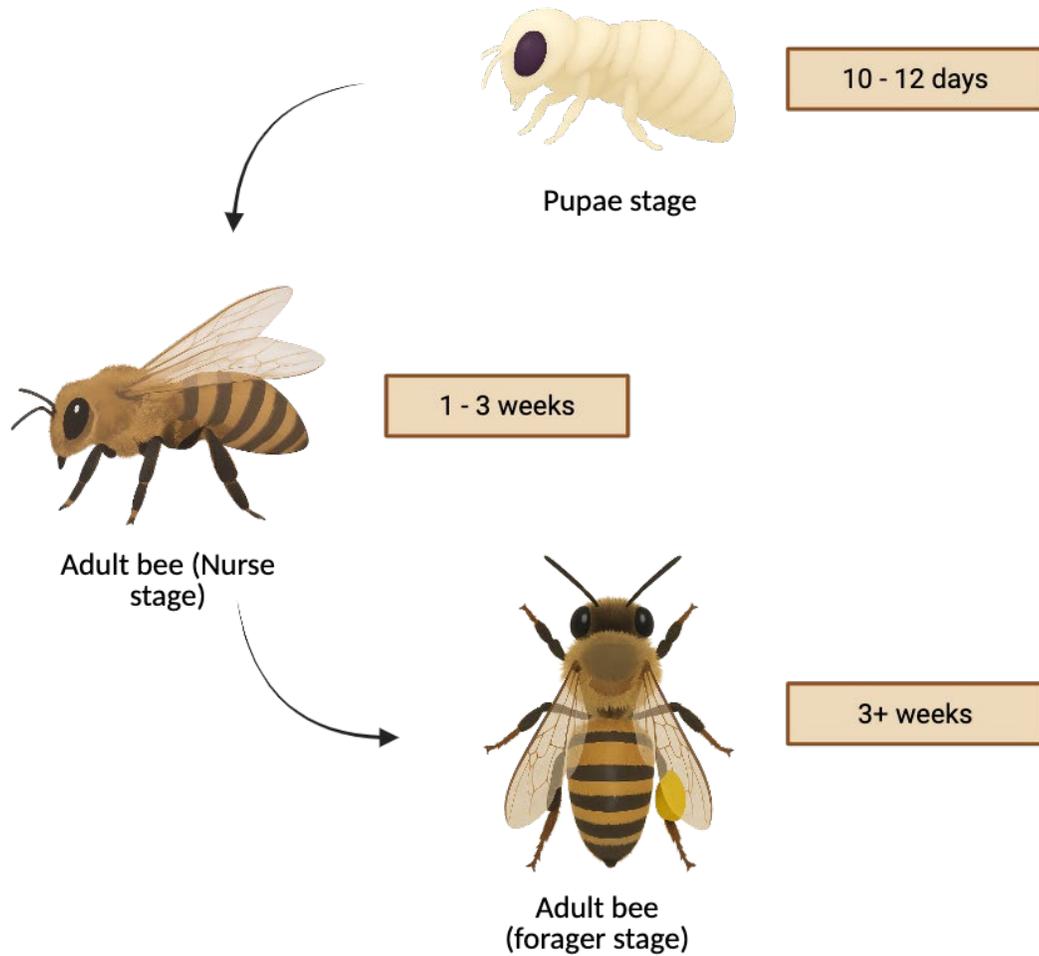


Fig. 2. Forager bee tethered to a flight mill used to test the flight ability. Tosi et al., 2017. [https://www.researchgate.net/figure/The-flight-mill-used-to-test-the-flight-ability-of-tethered-forager-bees\\_fig1\\_316487864](https://www.researchgate.net/figure/The-flight-mill-used-to-test-the-flight-ability-of-tethered-forager-bees_fig1_316487864)

Created in <https://BioRender.com>



# Flight Mill Data

	Flight Distance	Flight Time	Mean Velocity	Max Velocity
High biting ( $\bar{x}$ )	1,521.32	4,356.46	0.34	0.45
Low biting ( $\bar{x}$ )	1,524.93	5,773.62	0.34	0.38
F (1, 7) statistic	0.00	0.11	0.01	2.00
p-value	1.00	0.76	0.91	0.20

# CONCLUSION

- There was a significant difference between the mite biting behavior from two different populations of colonies
- The data from the flight mill experiments is not sufficient to draw a conclusion yet.
- Research will be continued.



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# THANK YOU!



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