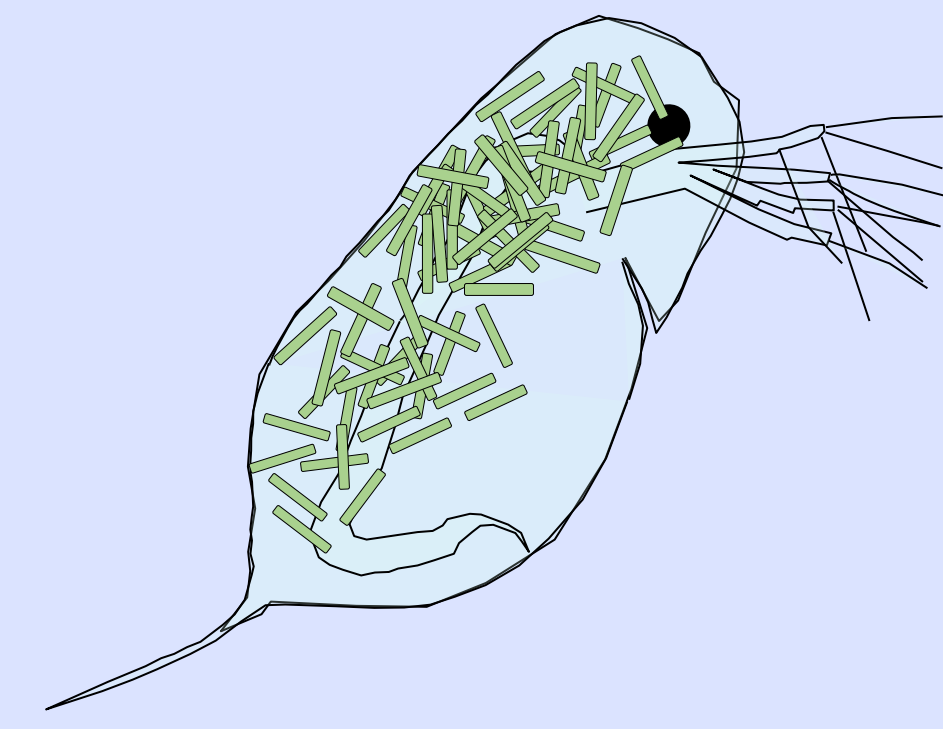


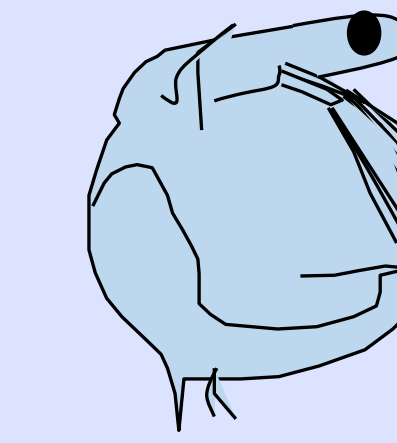


# Effects of temperature fluctuation on disease transmission in multi-host communities



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## INTRODUCTION

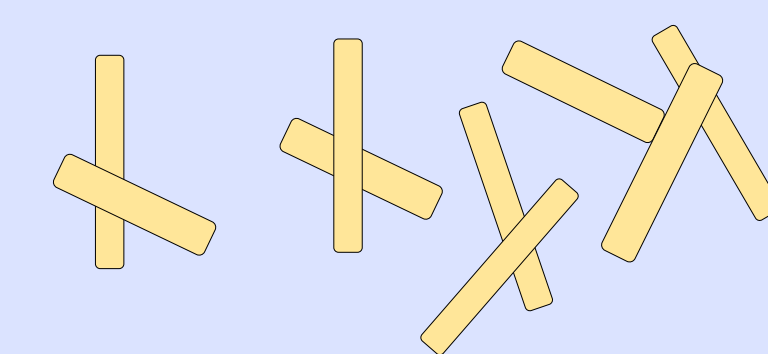
- The dilution effect predicts an increase in diversity will lead to a decrease in disease transmission.
- Different individuals will thrive at different temperatures, which directly affects community composition.
- Co-existence between the focal host and diluter needs to be established to have the dilution effect occur.
- Important to think about possible effects of climate change on disease dynamics in communities with multiple species.



*Daphnia dentifera*  
Host

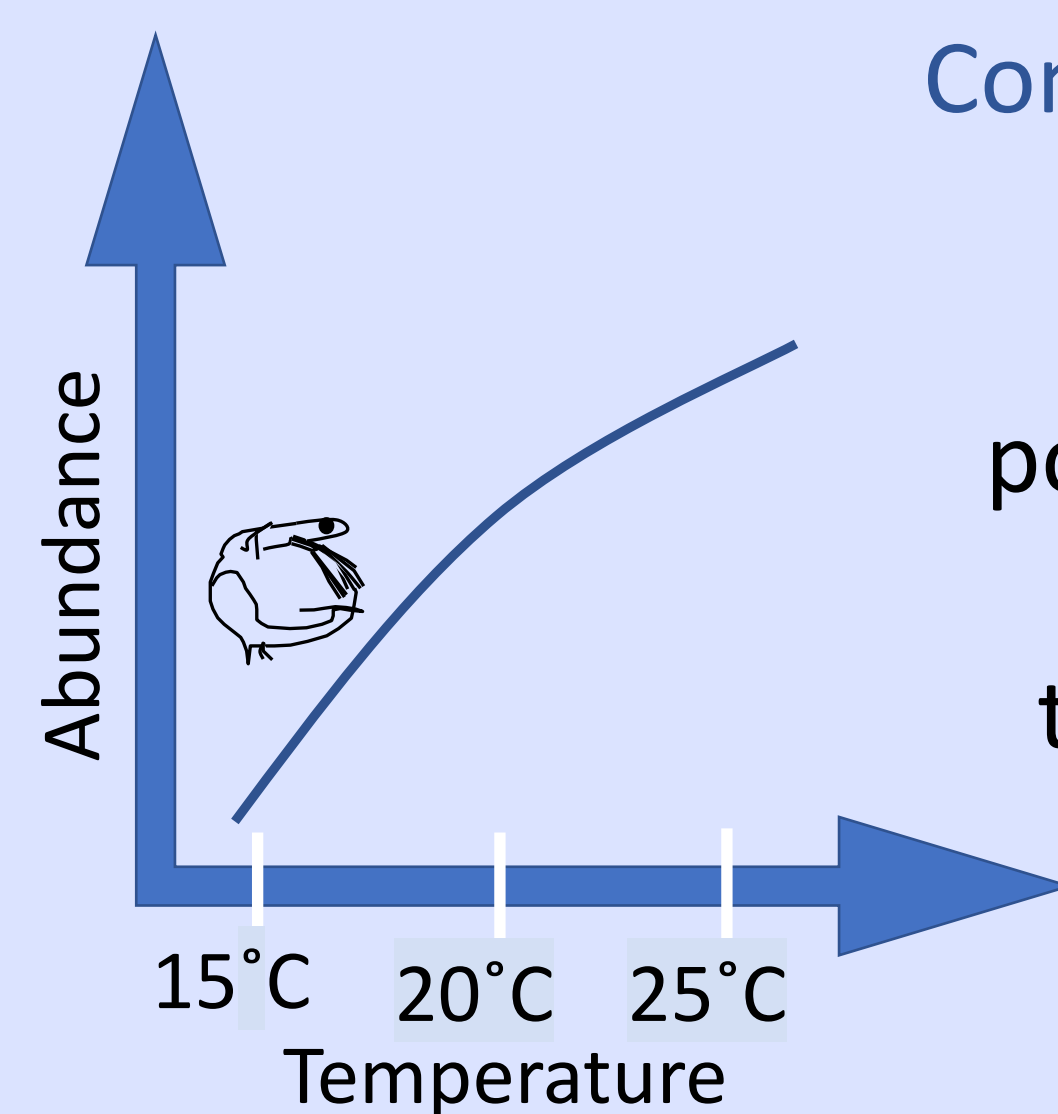


*Ceriodaphnia dubia*  
Diluter

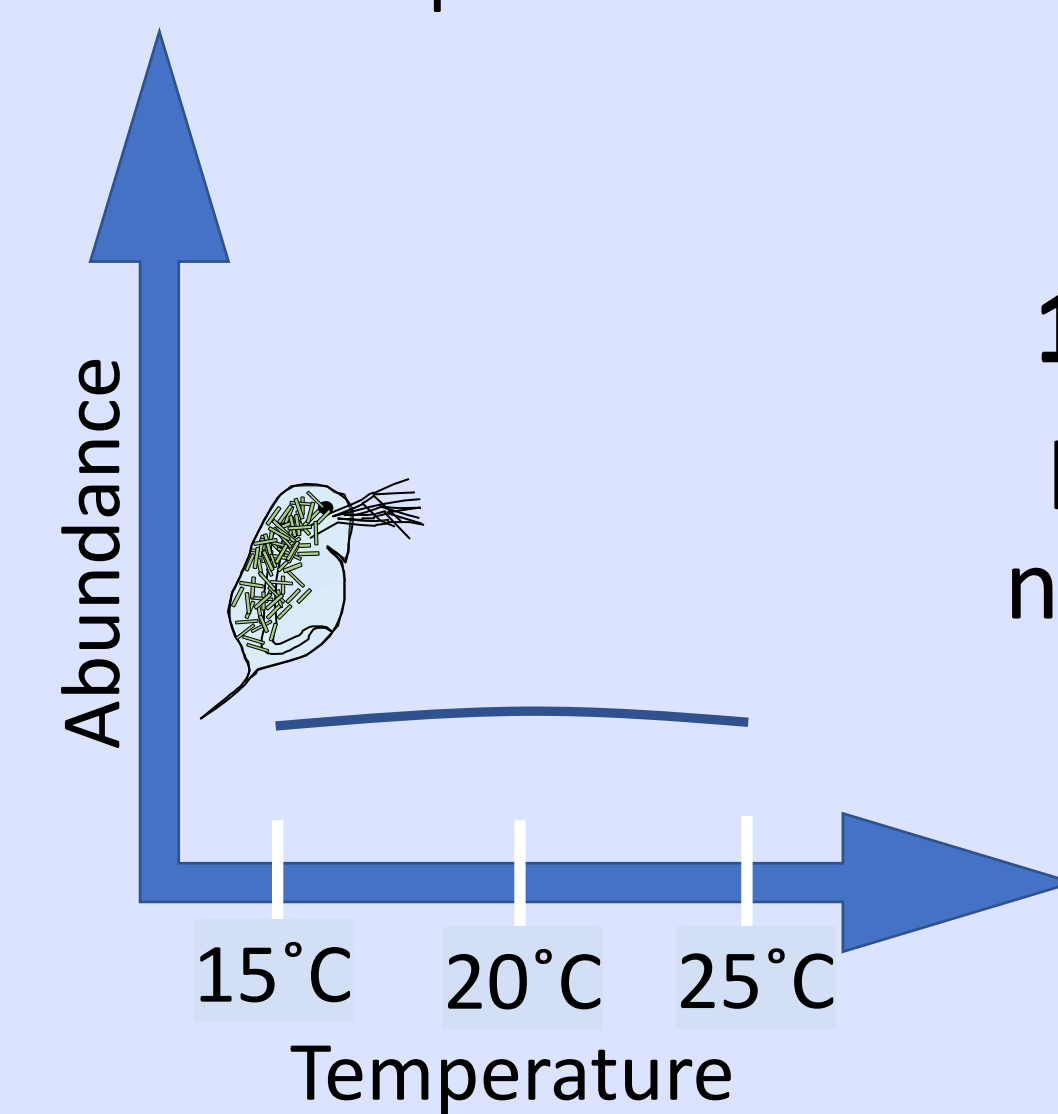


*Metschnikowia bicuspidate*  
(Fungal Spores)  
Parasite

### Conceptual graphs



1A: *C. dubia* populations rise in higher temperatures



1B: *D. dentifera* populations do not rise in higher temperatures

## QUESTION:

**How does fluctuating temperature impact abundance of hosts and diluters, and infection prevalence?**

- Hypothesis:** We hypothesize that the changing environmental conditions caused by fluctuating temperature will lead to more diluters, causing a greater dilution effect via co-existence of the host and diluter.

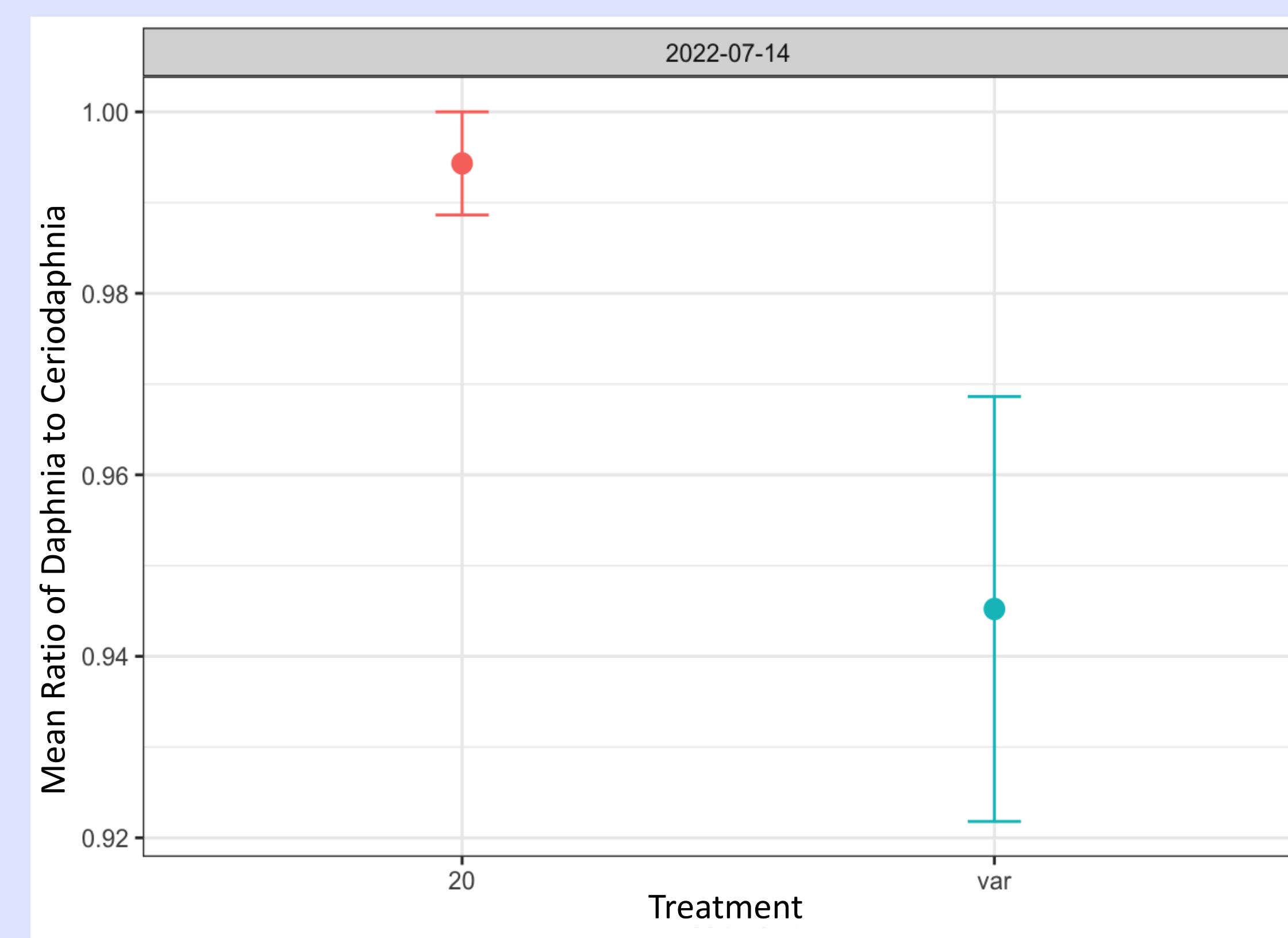
## METHODS

- Mix Bucket
- Use pitcher to collect sub-sample
- Collect 1-liter samples
- Filter community in mesh cloth and count

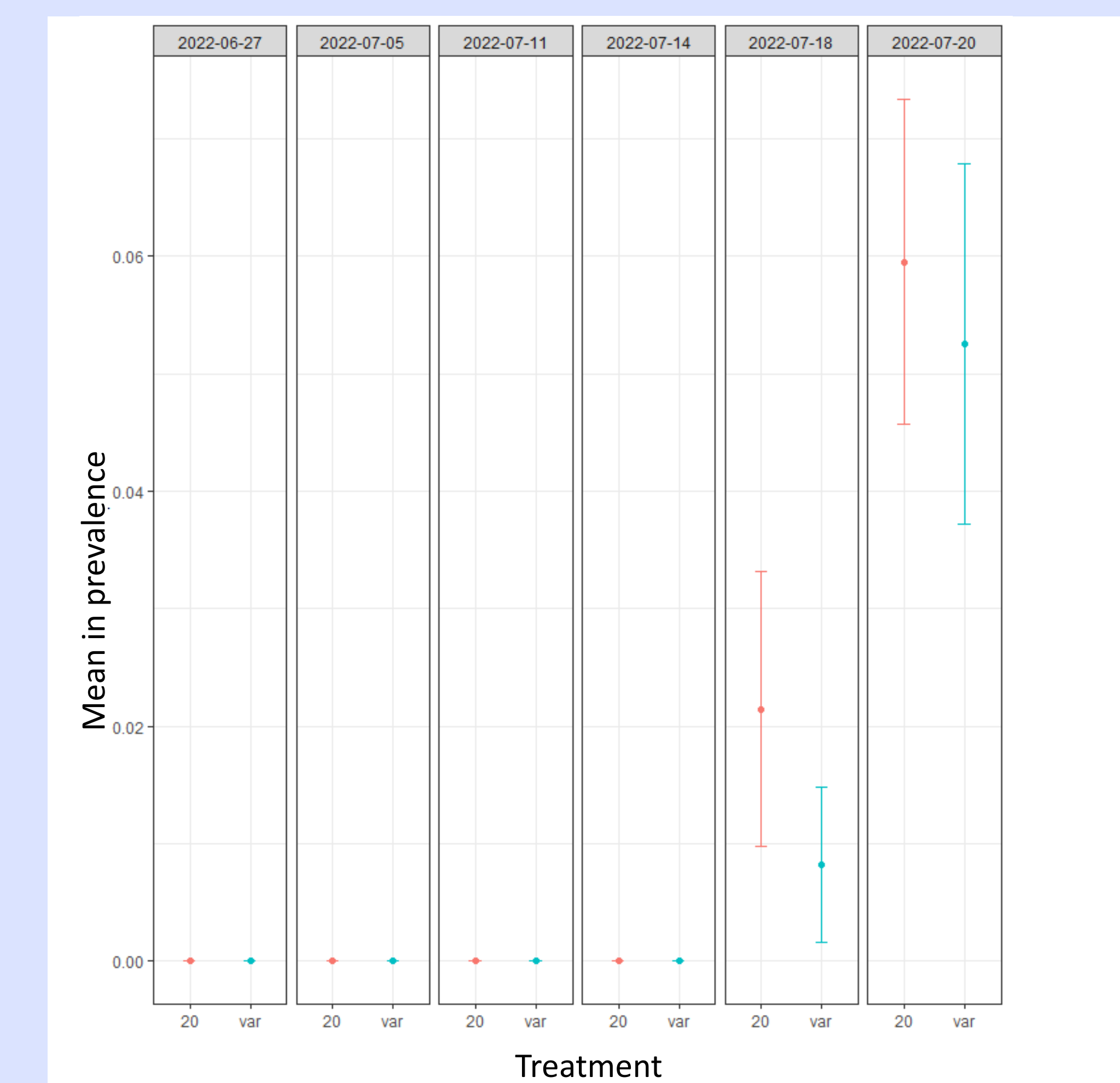
A multi-generational mesocosm experiment with host + parasite and host + diluter + parasite communities at both mean (20°C) and fluctuating (18-24°C) temperatures.



## CURRENT RESULTS



2: More Ceriodaphnia in the variable temperature treatment than at 20°C.



3: Early infection prevalence is similar, insignificant.

## CONCLUSIONS

- Fluctuating temperatures are currently increasing the number of diluters, *C. dubia*, which may then cause a dilution effect as both species come into co-existence.

## FUTURE WORK

Could changing different factors in this experiment impact the effect of temperature on host prevalence?

- Using locally sourced zooplankton rather than lab grown
- More extreme variable temperature range
- Bigger tanks



## ACKNOWLEDGEMENTS

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