Genetic diet specialization in phytozoophagous and zoophytophagous mirids

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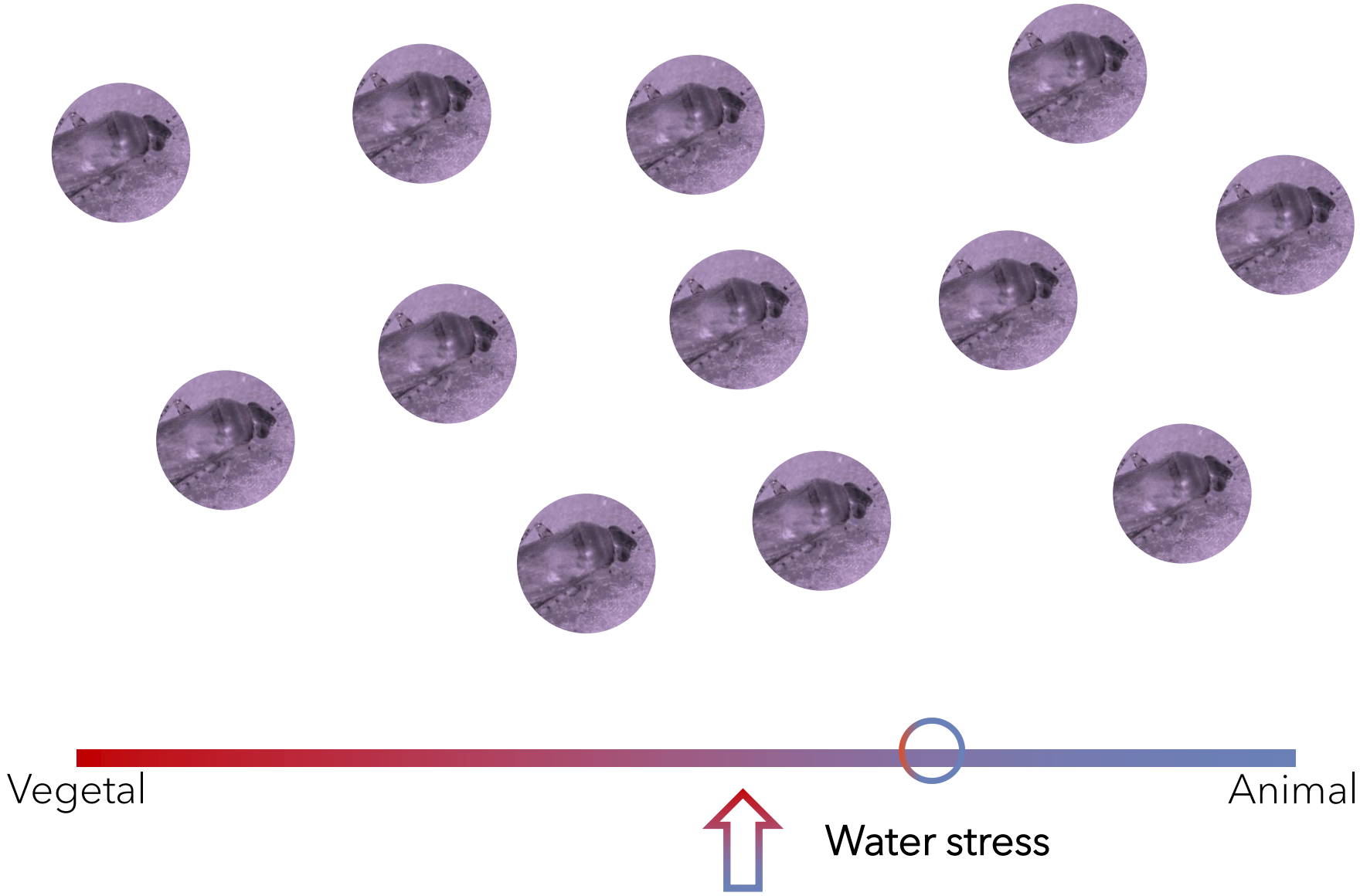
Diet: proportion of prey & plant resources

- Prey availability
- Host plants
- Prey type
- Water stress



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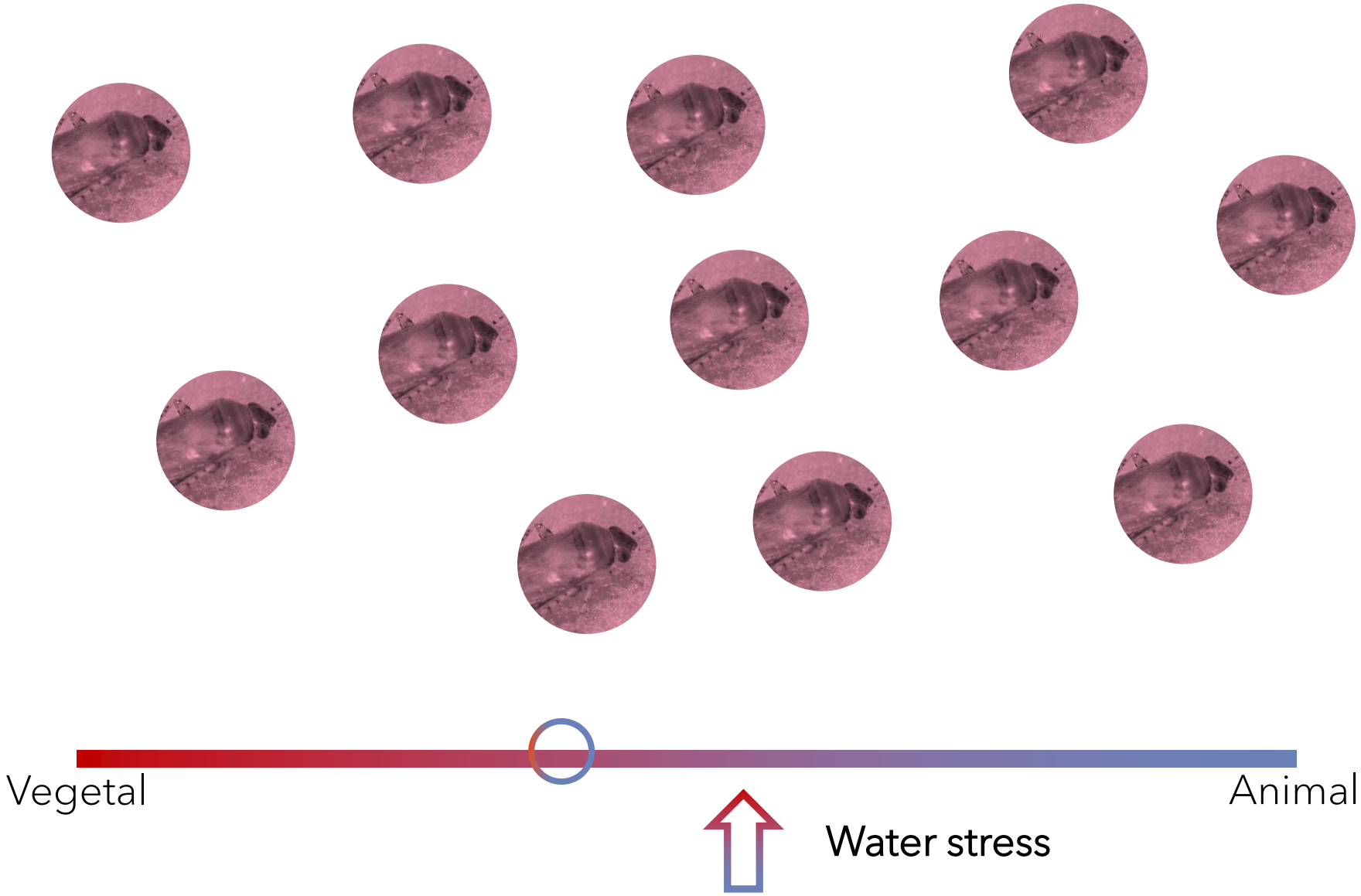
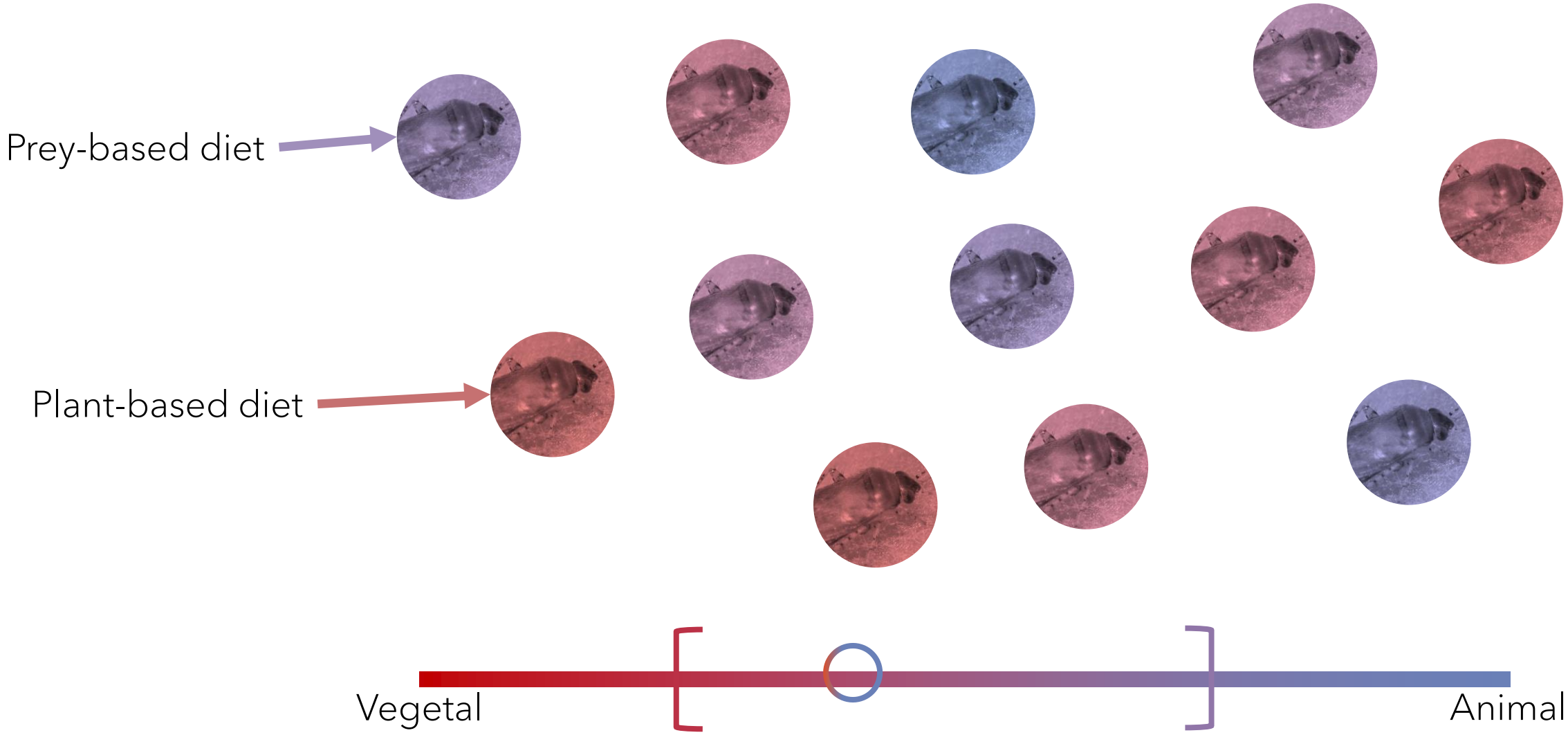


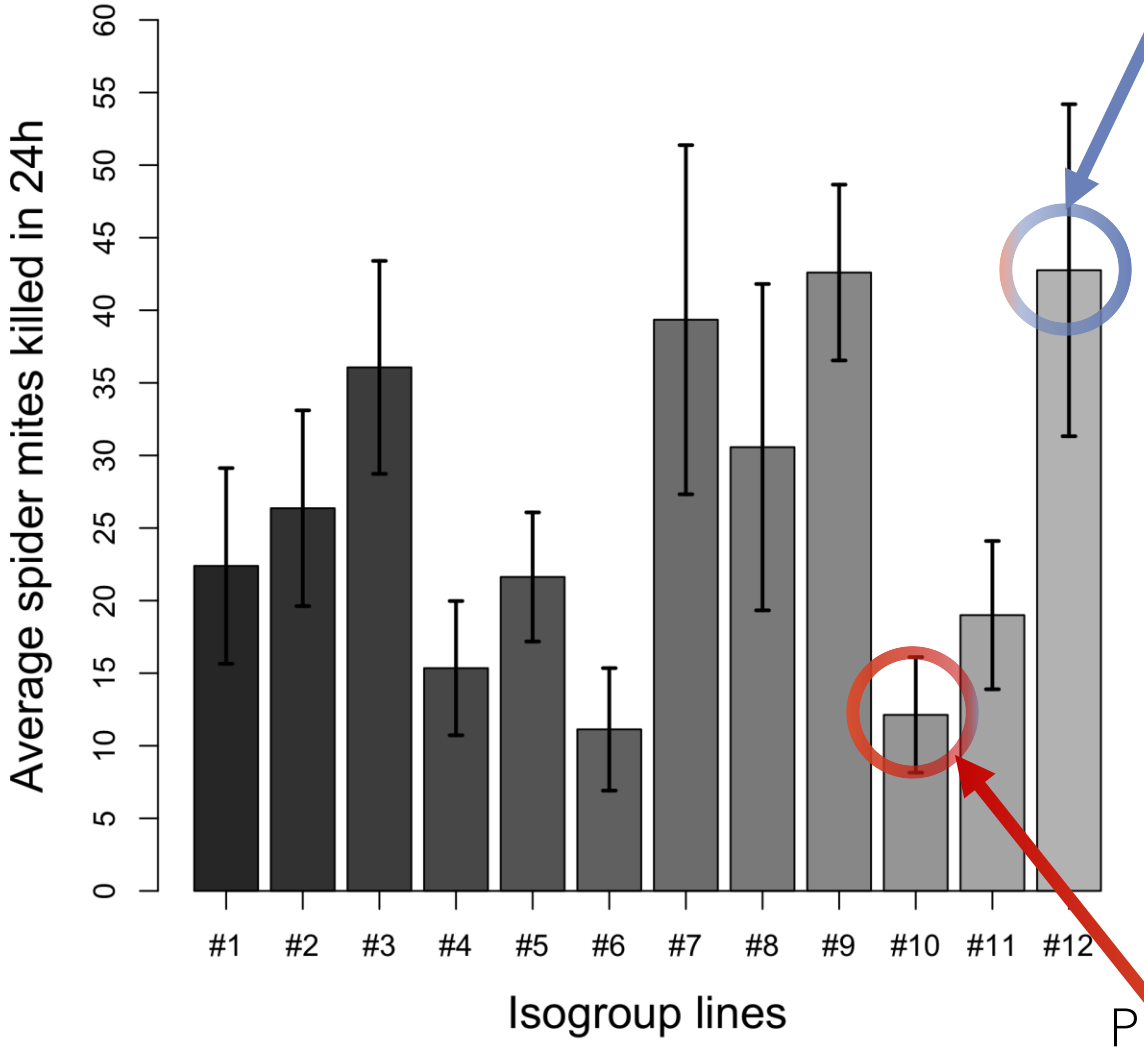
Diet: individual differences

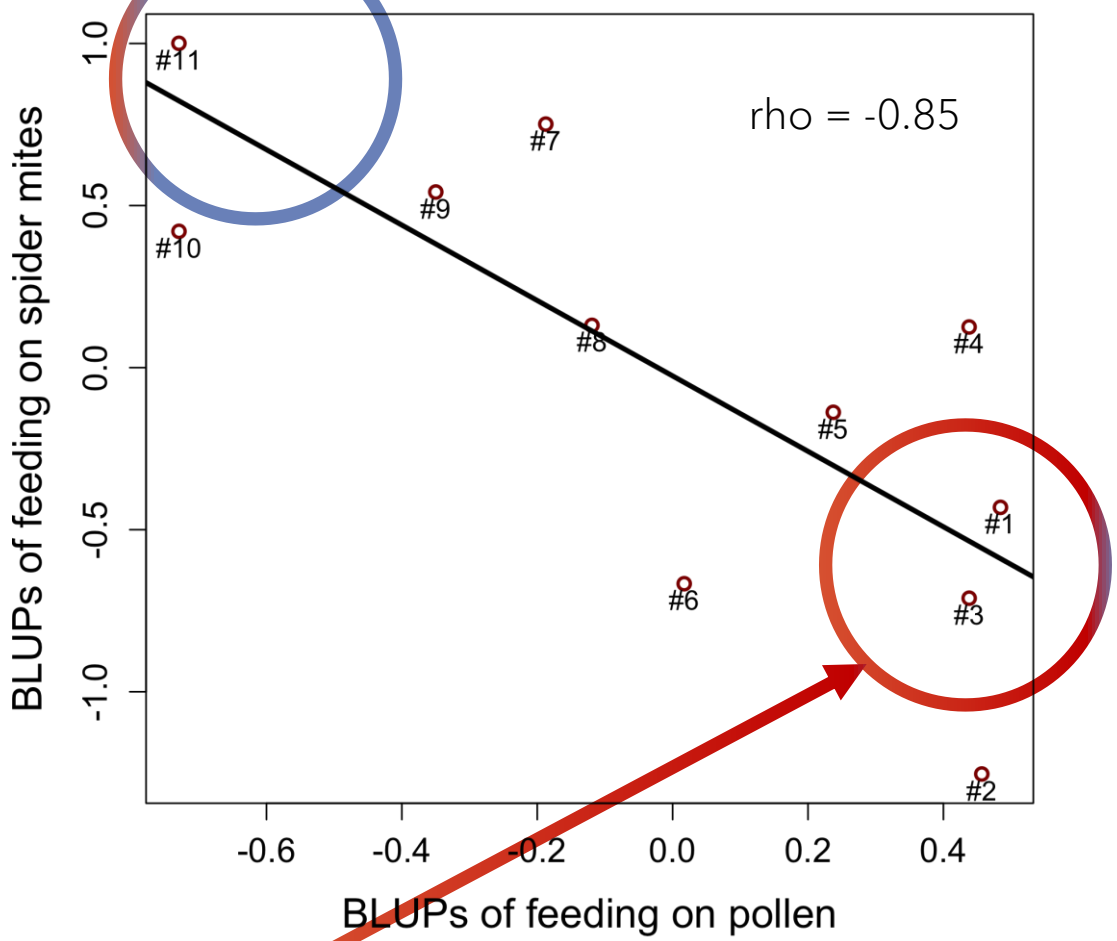


Genetic variability & diet specialization

Prey-specialized lines

High level of zoophagy



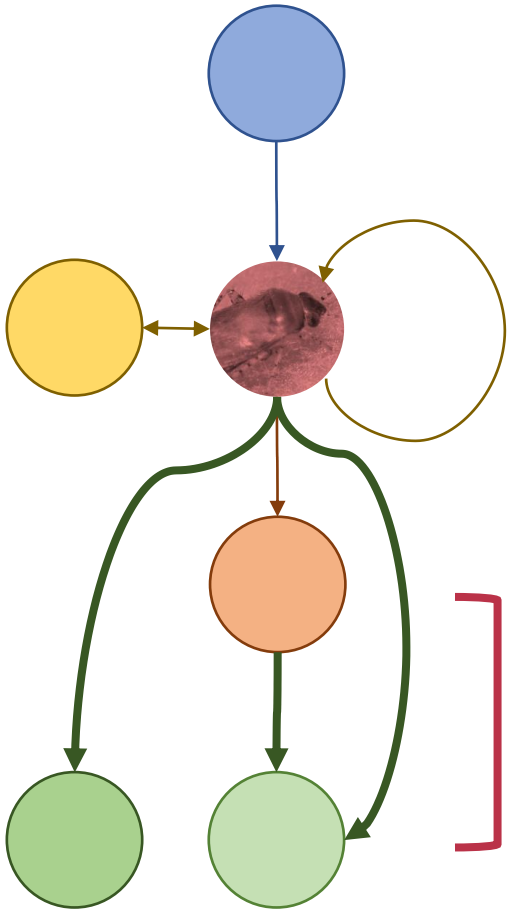


Plant-specialized lines

Low level of zoophagy

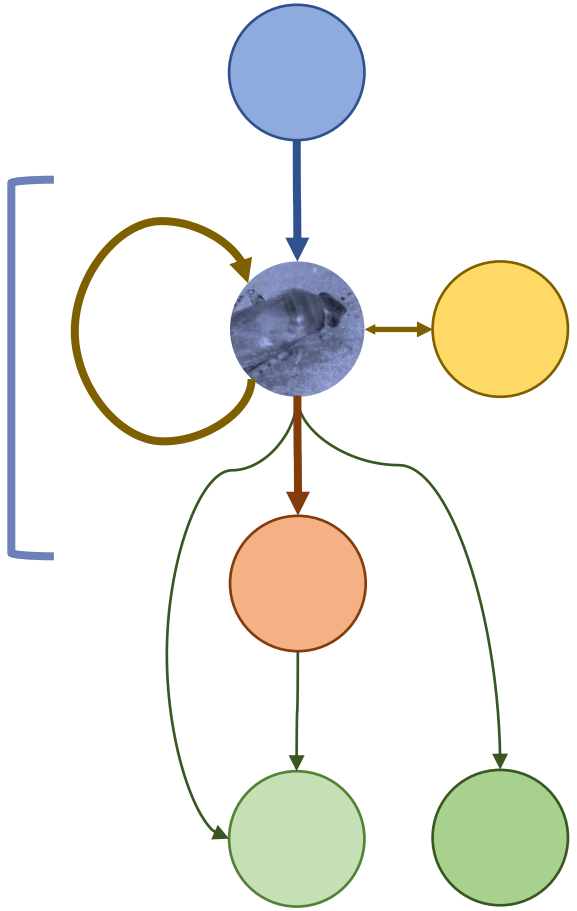
Dumont et al. (2016 & 2017)

Ecology & Economic incidence



- Plant-based diet
- Increased risk of damage
- Predator avoidance

- Prey-based diet
- Increased pest control
- Increased IGP & CNB
- Prone to predation



Vegetal — Animal

Objectives

Lygus lineolaris

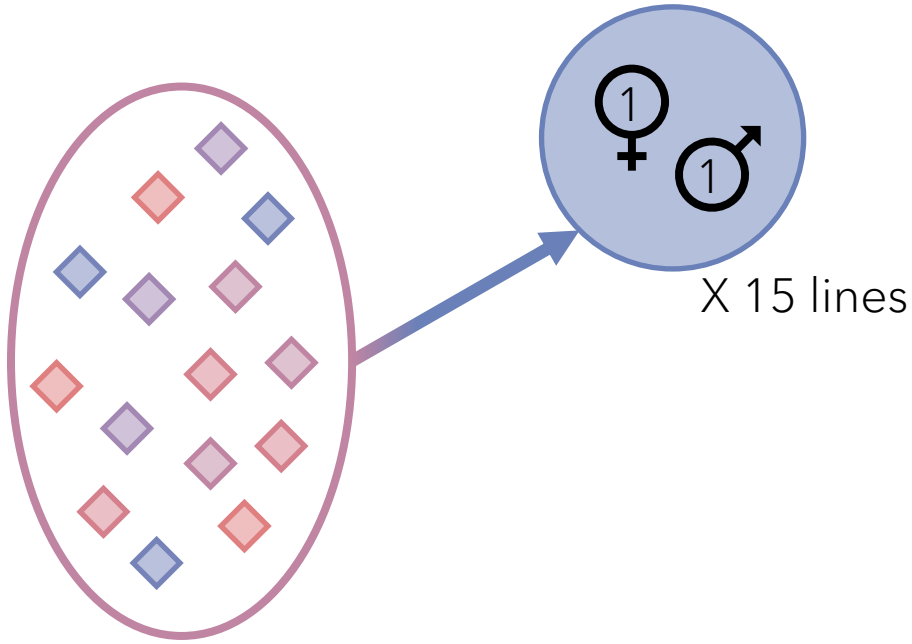
- Zoophagy level
- Response to plant resource availability

Dicyphus hesperus

- Zoophagy level
- Δ b/w males & females

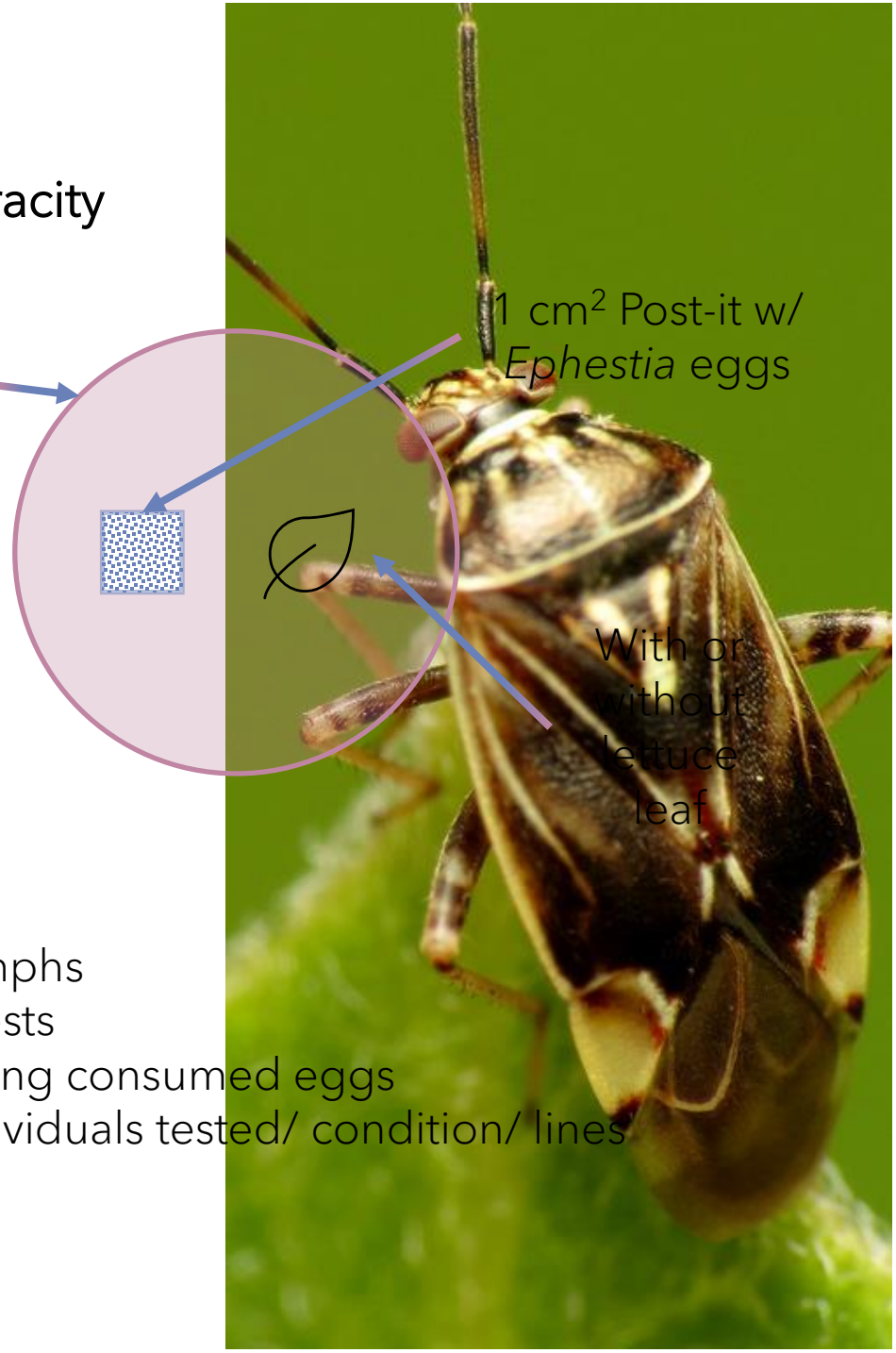
Methods : *Lygus lineolaris*

Isofemale lines



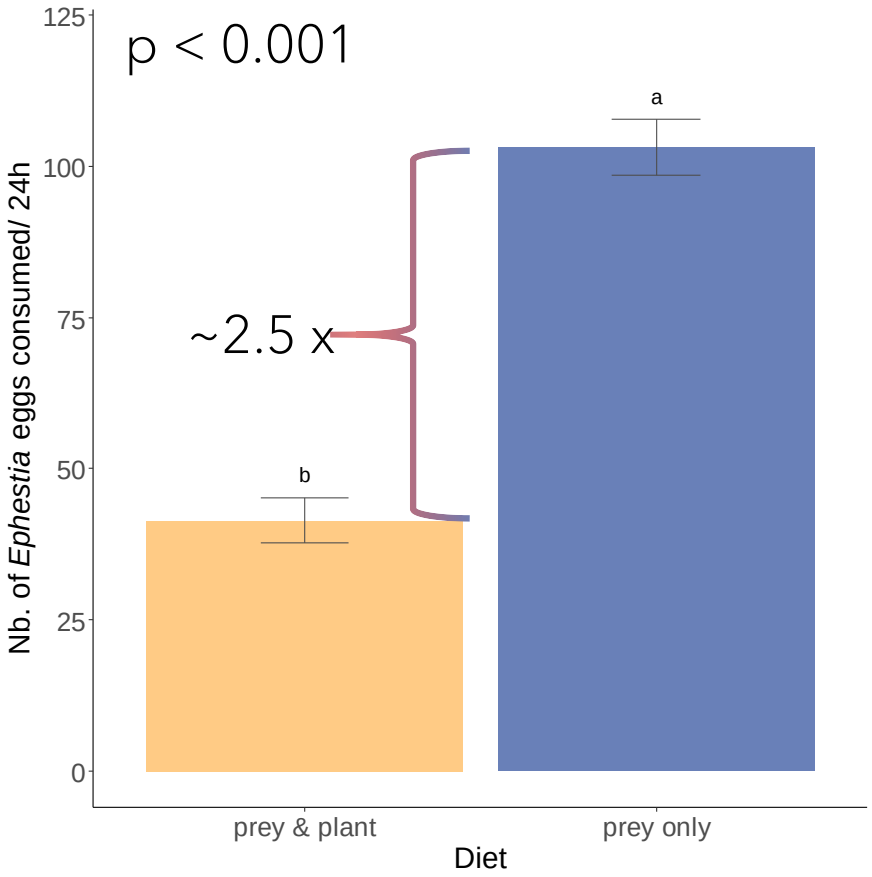
~1000 individuals

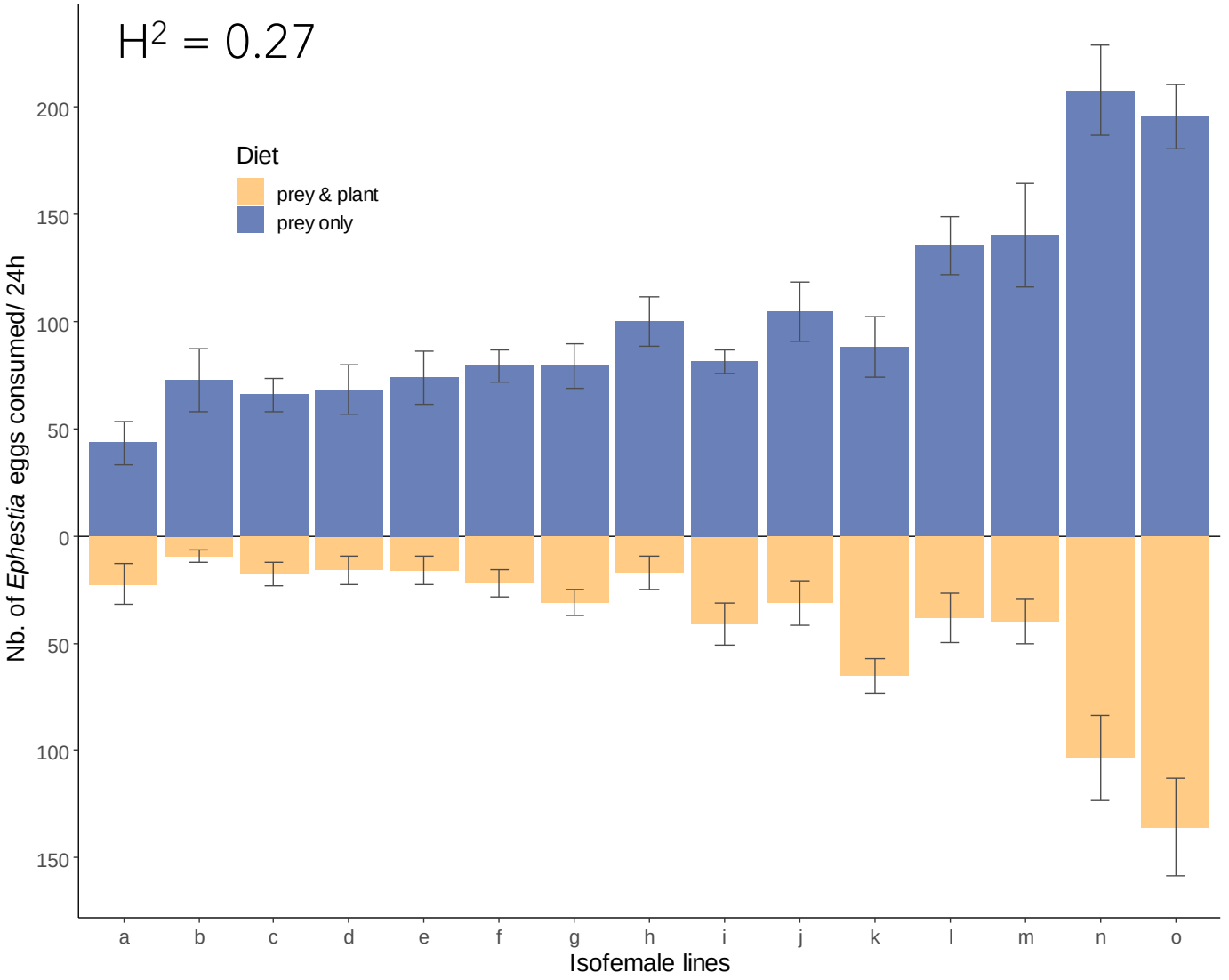
Tests of voracity



- L5 nymphs
- 24 h tests
- Counting consumed eggs
- 15 individuals tested/ condition/ lines

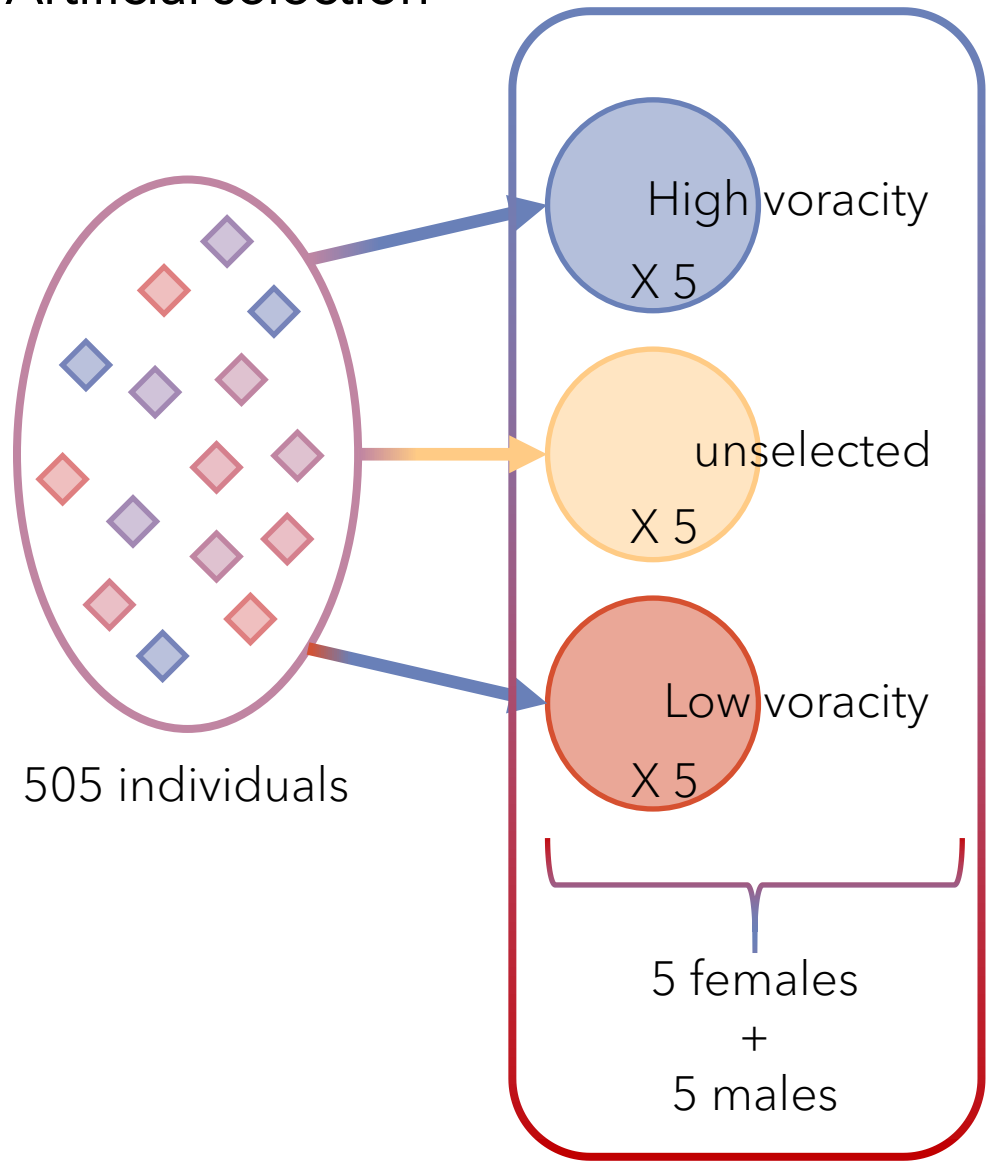
Lygus lineolaris



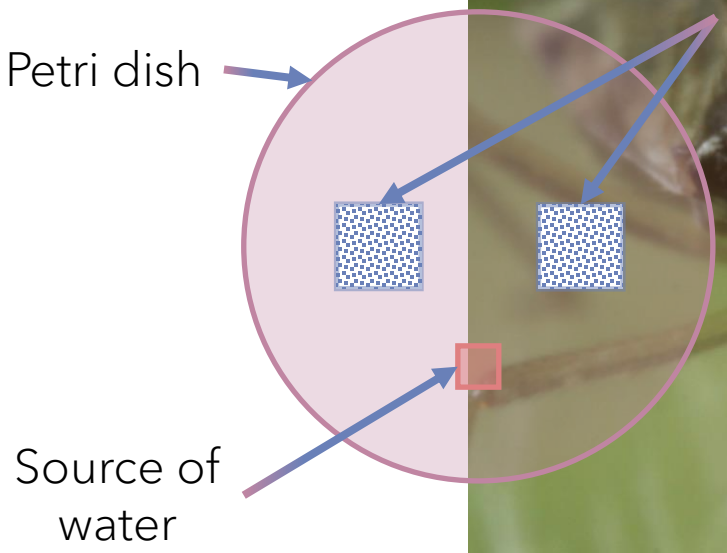


Methods : *Dicyphus hesperus*

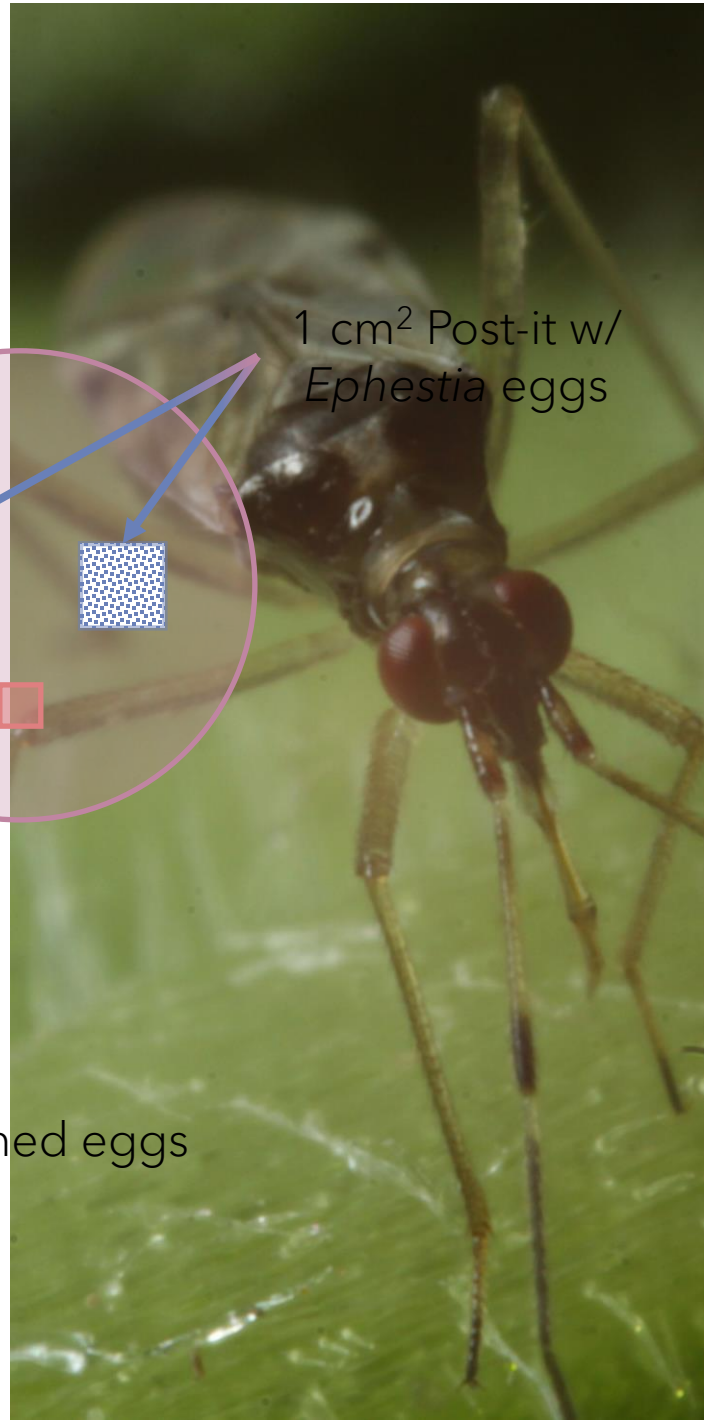
Artificial selection



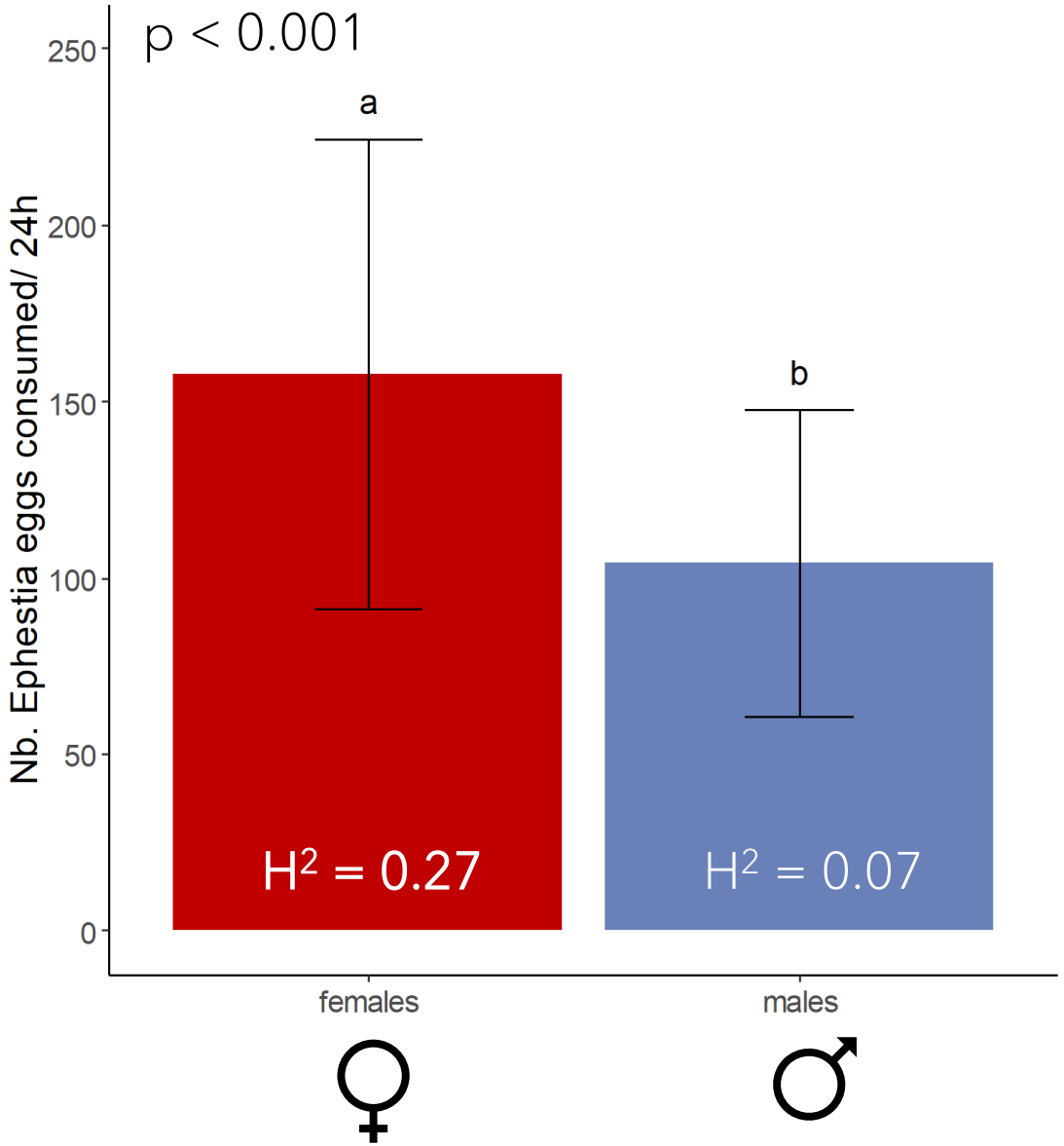
Tests of voracity

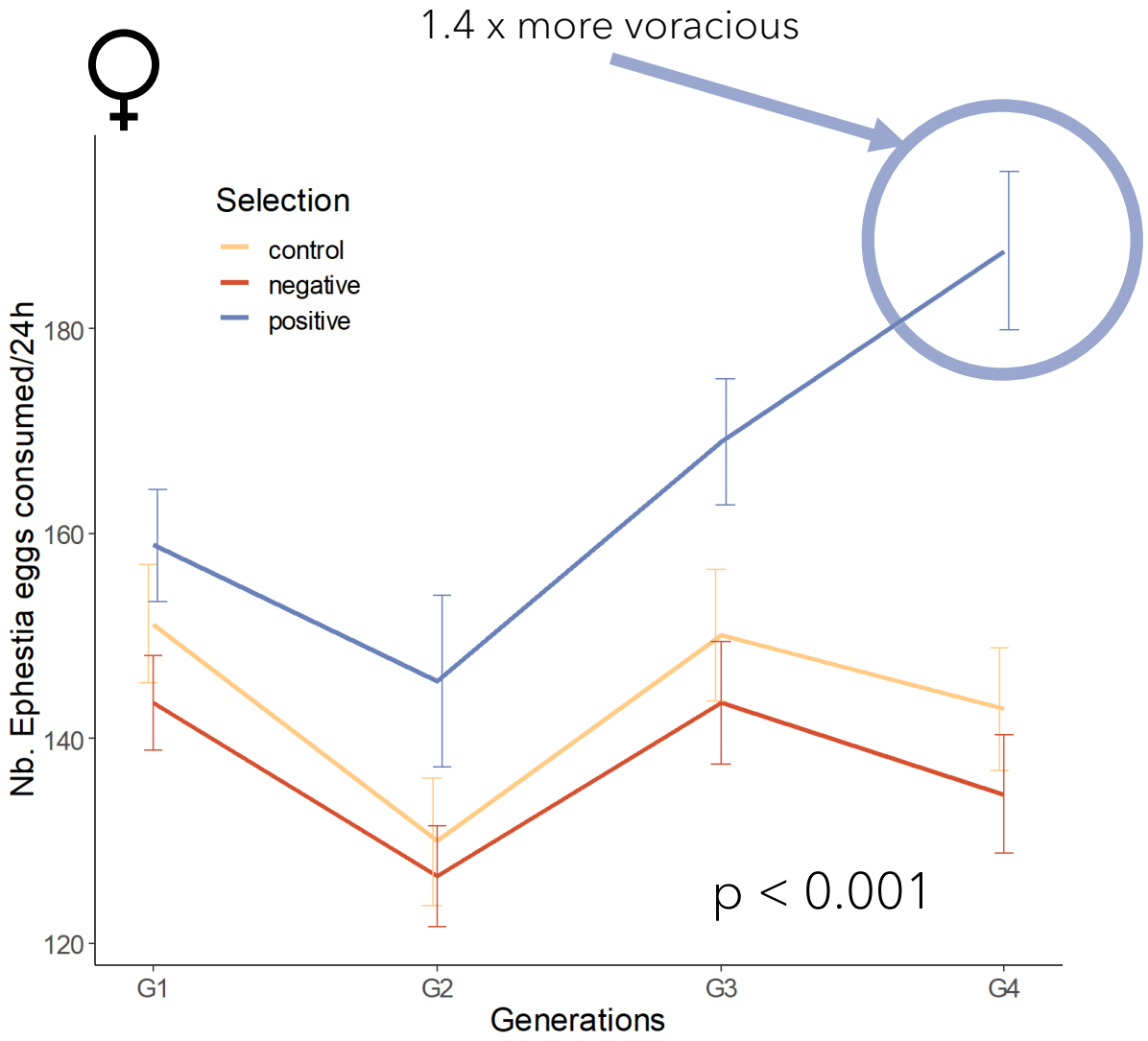


- Virgin adults
- 24 h tests
- Counting consumed eggs

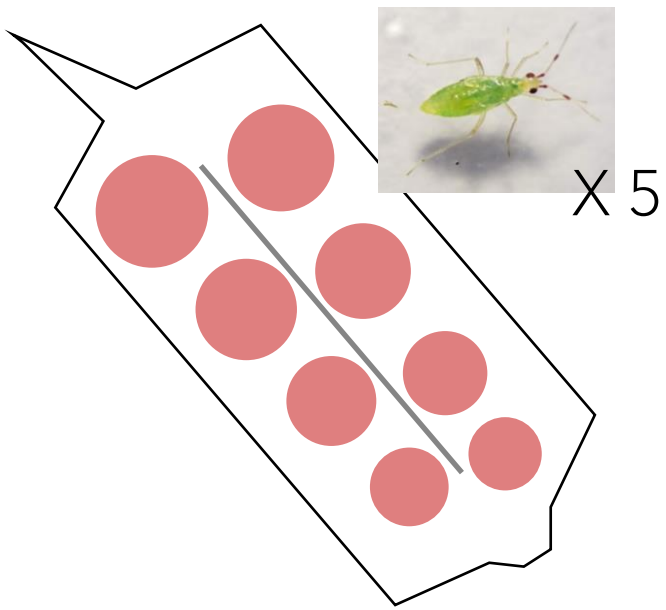


Dicyphus hesperus

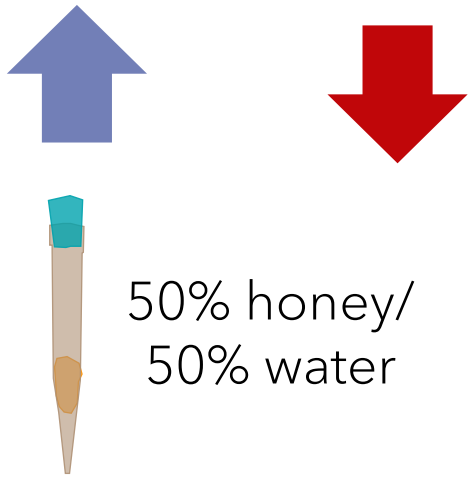




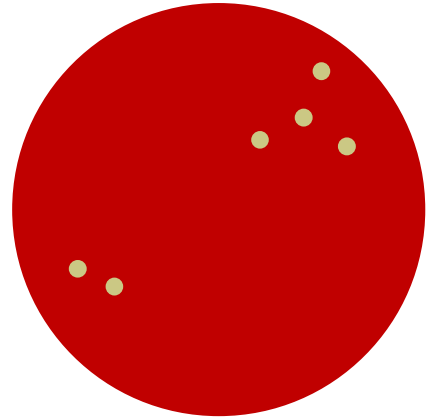
Methods : Damage by *Dicyphus* lines



Highly voracity vs Lowly voracity



50% honey/
50% water

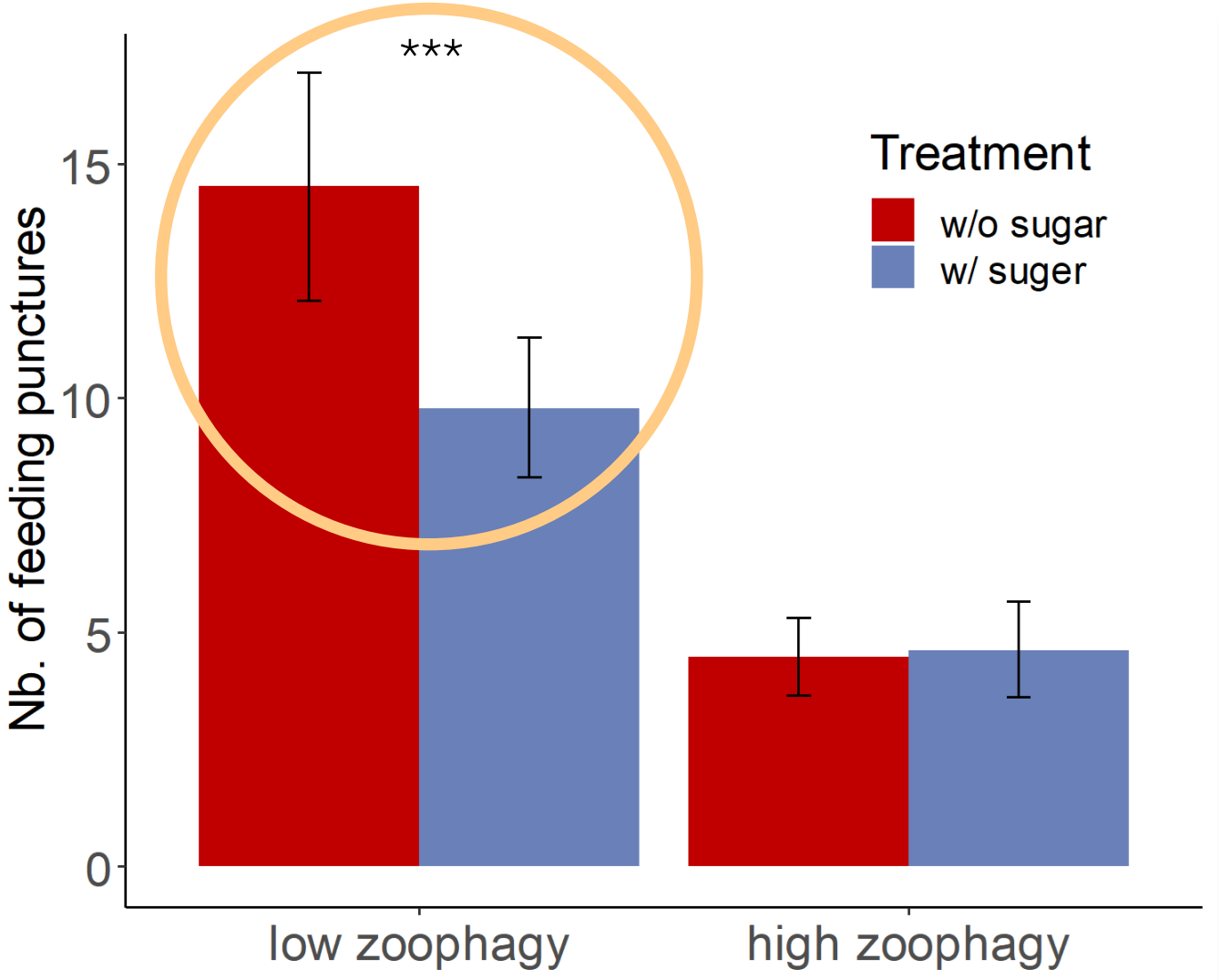


- Using 30 cm sleeve over tomato cluster (about 8 tomatoes)

- 14 days
- 15 rep/combination of treatments

- Counting the number of punctures on every tomatoes

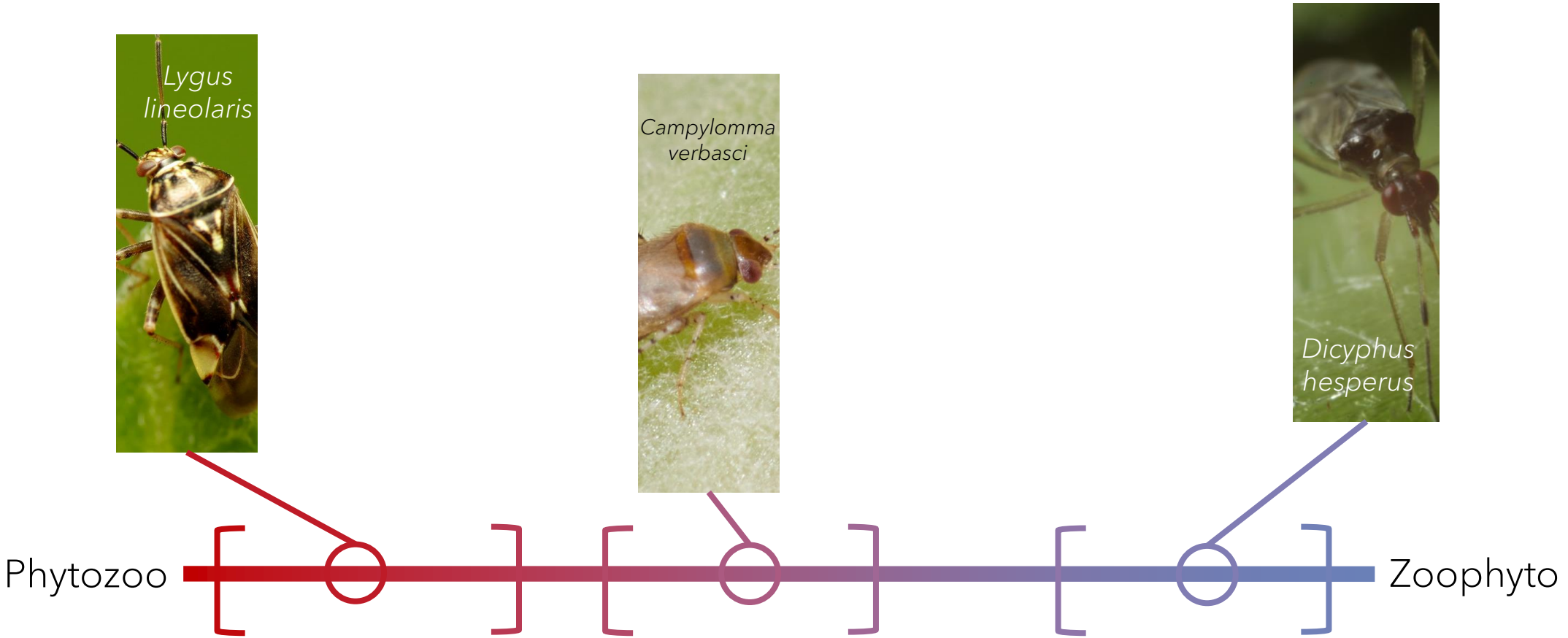
Damage by *Dicyphus hesperus* lines



- Lowly zoophagous lines cause 2.7 times more damage ($p < 0.0001$)
- Sugar reduced damage ($p = 0.0009$), but…
- Only the lowly zoophagous lines responded to the availability of sugar ($p = 0.0001$).

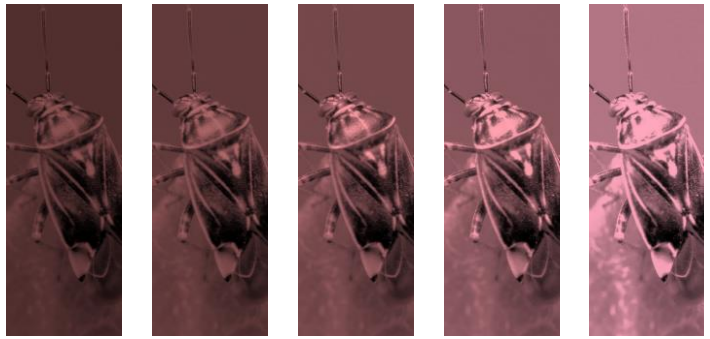
Conclusion

- Genetic variability in feeding behavior is important in Mirid species with very different diets.
- The composition of populations may vary depending on selection pressures.



Up next

How the system can evolve
in response to our actions?



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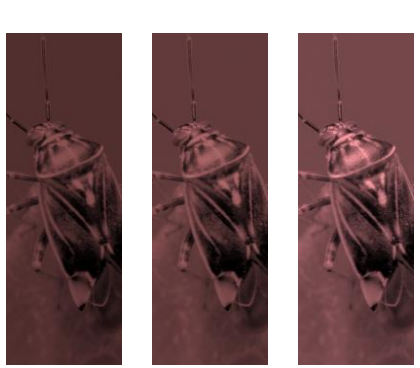
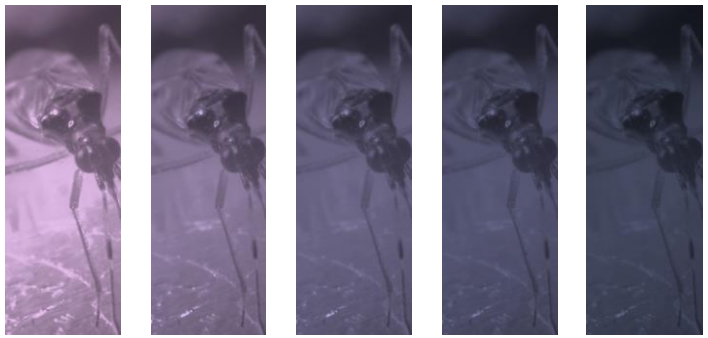
How the system can evolve in response to our actions?

Can the benefit/risk ratio be improved by artificial selection?





Phytozoo

Zoophyto

Up next

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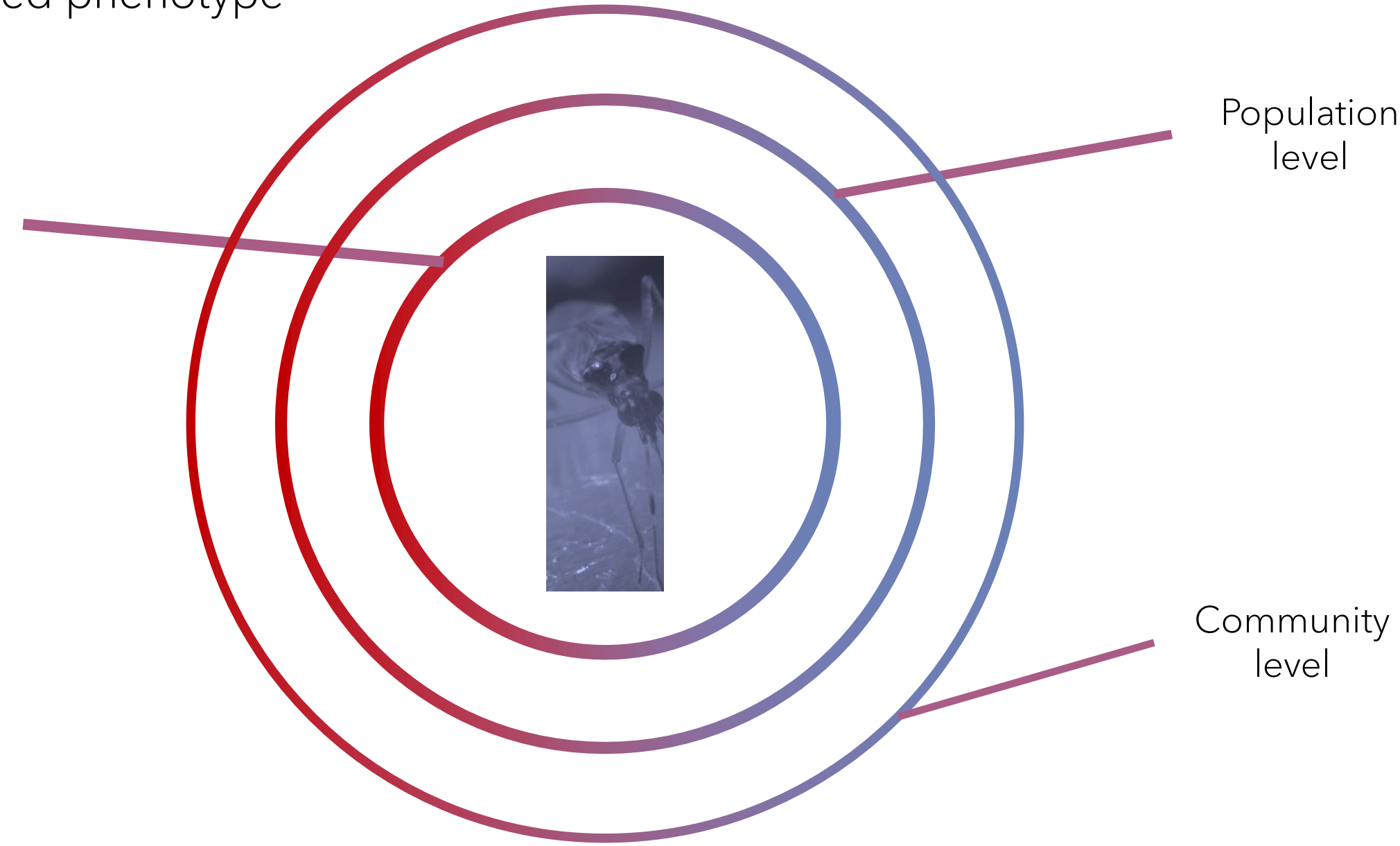
The extended phenotype



Kiitos

The Team at the CRAM

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