TAC meeting #1: 24/05/21

TAC meeting #2: 6/12/21

TAC meeting #3: 26/04/22

TAC meeting #4: 18/11/22

Project 1: The effects of invertebrates on ecosystem functions and services

Project 2: A global meta-analysis reveals that beneficial biodiversity is positively associated with landscape heterogeneity in conventional agroecosystems

Project 3: Crop compositional heterogeneity suppresses the abundance of *Pieris canidia*, a major pest of cruciferous vegetables

Project 4: The effects of fine scale heterogeneity in urban green spaces on pollinator communities

Project 1: The effects of invertebrates on ecosystem functions and services

("decomposition" OR "breakdown" OR "decay*" OR "mass loss" OR "mass remaining" OR "nutrient cycl*" OR "dung removal*" OR "dung burial*" OR "pest control*" OR "biological control*" OR "natural enem*" OR "fruit set*" OR "seed set*" OR "yield") AND ("species richness" OR "diversity" OR "biodiversity") AND ("insect*" OR "arthropod*" OR "inverte*" OR "macroinvertebrate*" OR "detritivor*") AND ("ecosystem function*" OR "stability" OR "ecosystem proces*" OR "ecosystem service*")

1. Decomposition
2. Nutrient cycling
3. Dung removal
4. Pest control
5. Pollination

2132 studies by July 2021 in WOS

↓

1939 screened 497 studies identified

↓

Data are completed for 133 studies

Project 1: The effects of invertebrates on ecosystem functions and services

1. Ecosystem functions/ services (Y) ~ Richness, Diversity, Functional diversity, Abundance, Presence/Absence, Visitation frequency, Species identity (X)

Positive, neutral or negative ?

Conduct a $\chi 2$-tests

Positive relationships are more or less common than negative and neutral relationships

2. Naturally assembled communities vs Controlled experiments

3. Biodiversity vs Functional diversity

Other possibilities?

4. Abiotic (i.e. climatic variables) vs Biotic factors

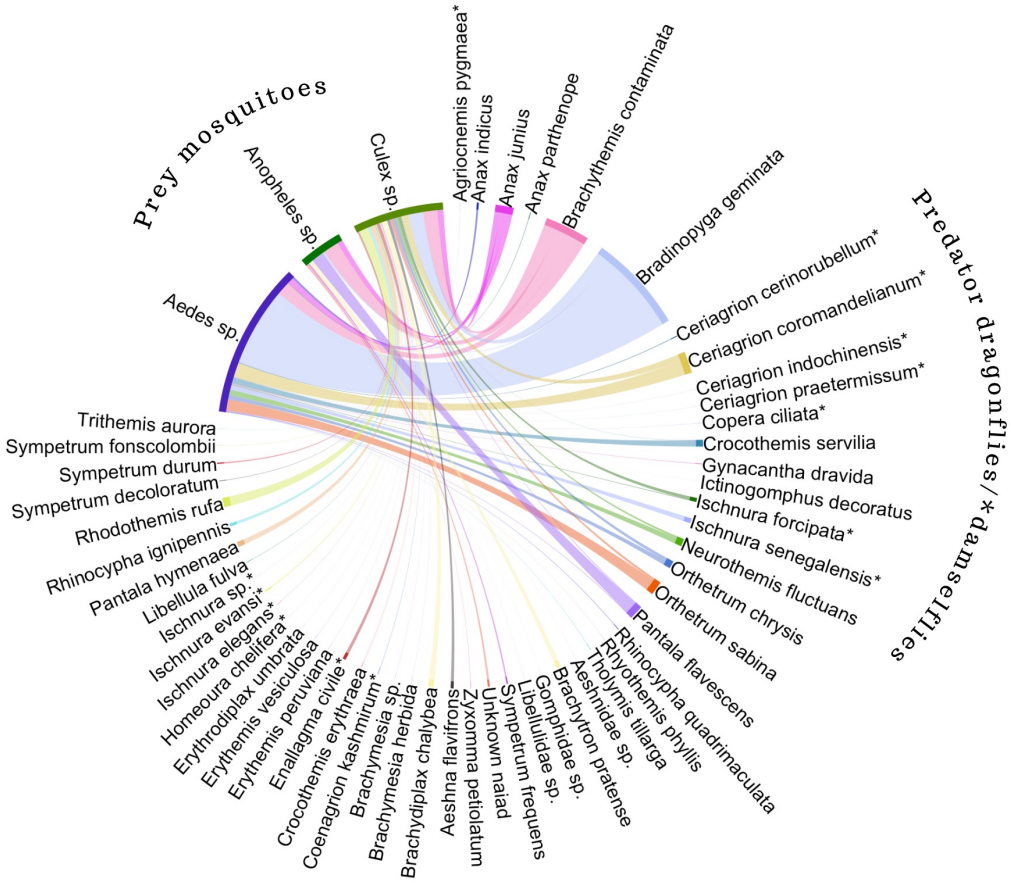
New idea: Mosquito larvae predation by odonates

Network meta-analysis

Malaria ⟷ Control ⟷ Dengue

224 studies were identified

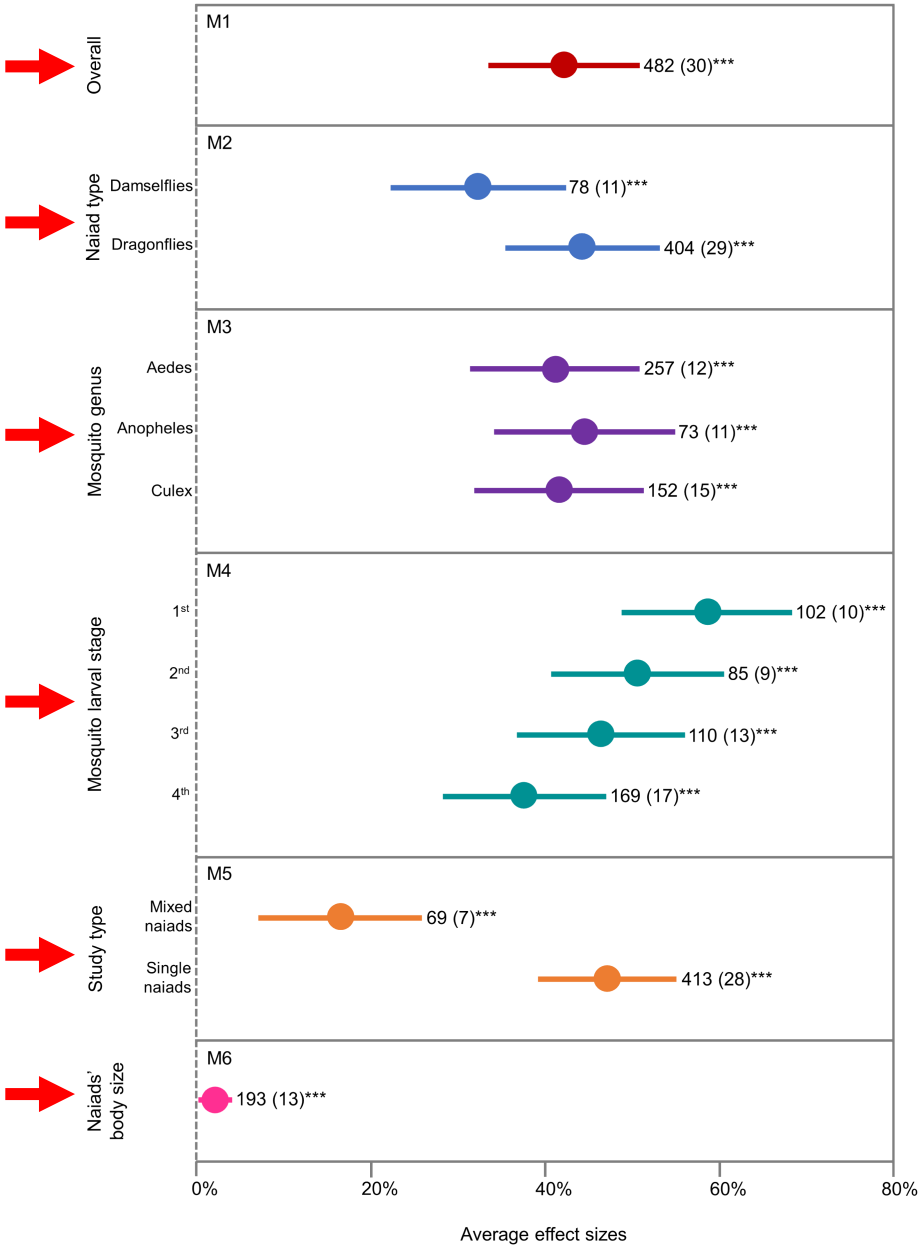
A meta-analysis reveals that dragonflies and damselflies can provide effective biological control of serious disease vectors



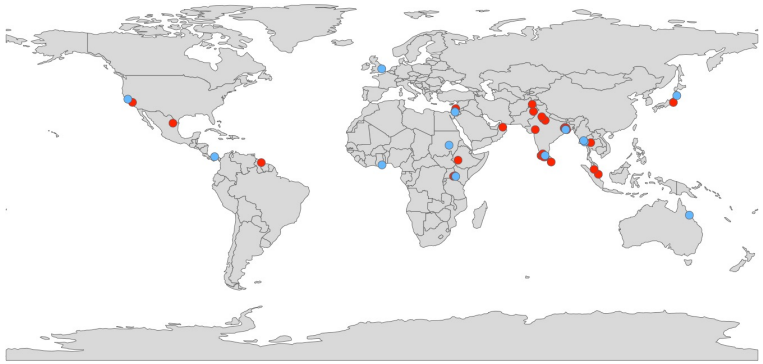
Dragonflies and damselflies for mosquito control

47 dragonflies/damselflies species feeding on and nine species of mosquitoes belonging to *Aedes*, *Anopheles* and *Culex* (n = 30)

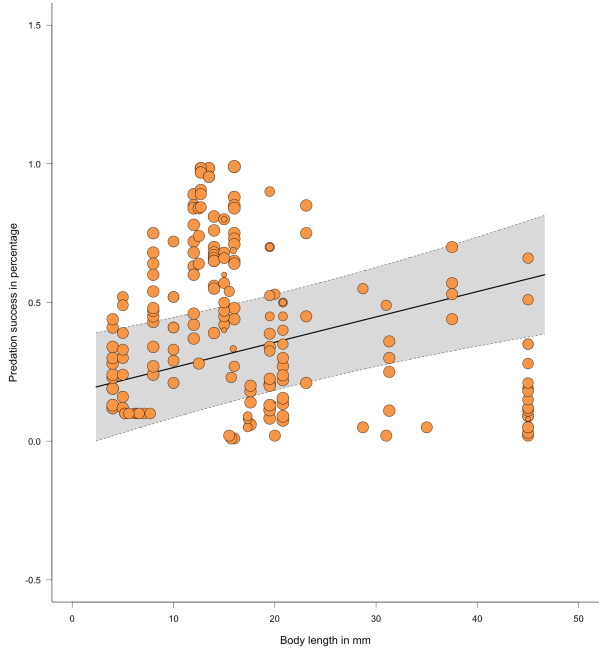
Priyadarshana and Slade 2022, Journal of Animal Ecology (in review)



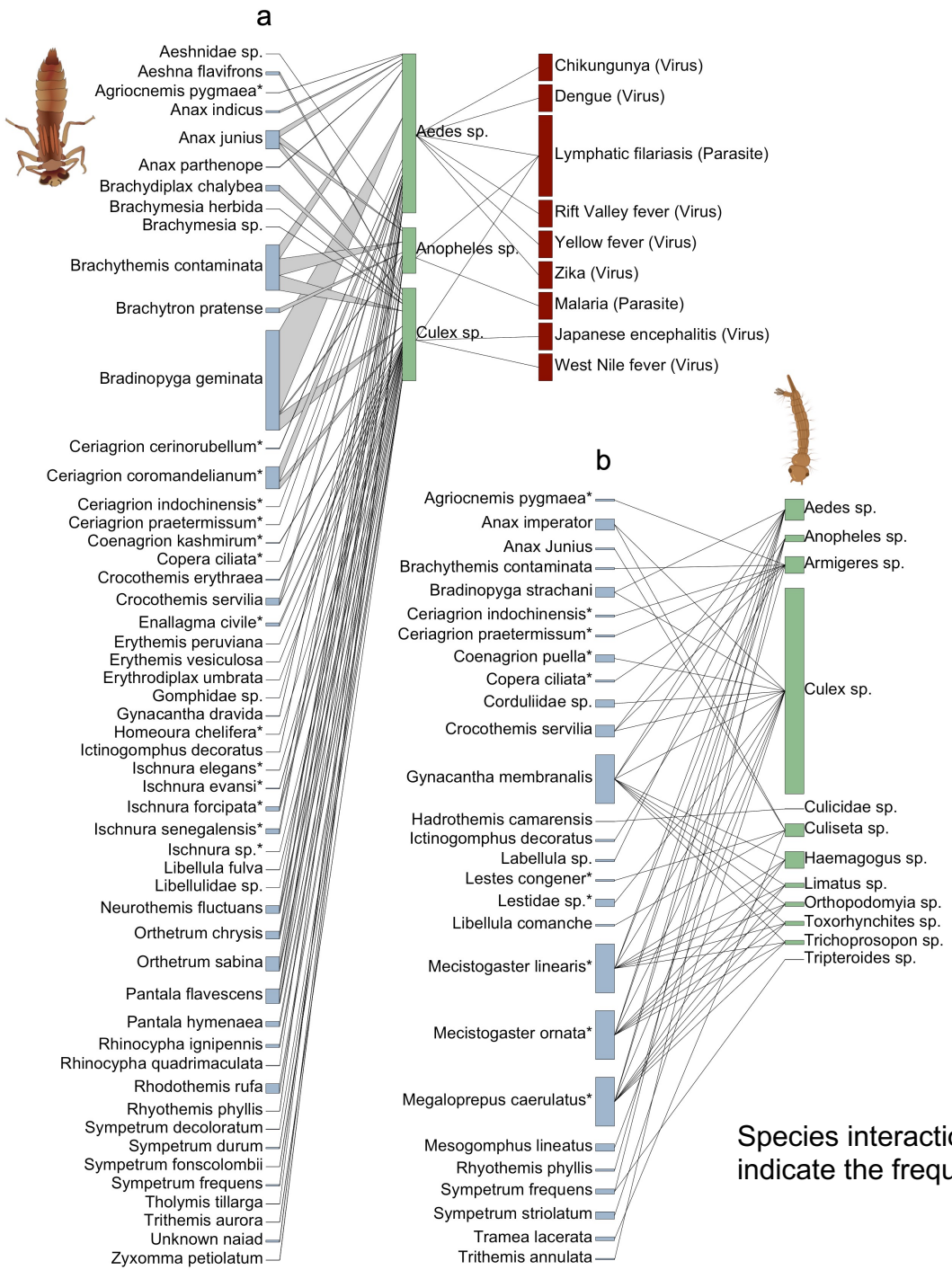
Estimated average effect sizes in percentage with 95% Confidence Intervals(CIs)



A map of the studies included in this study

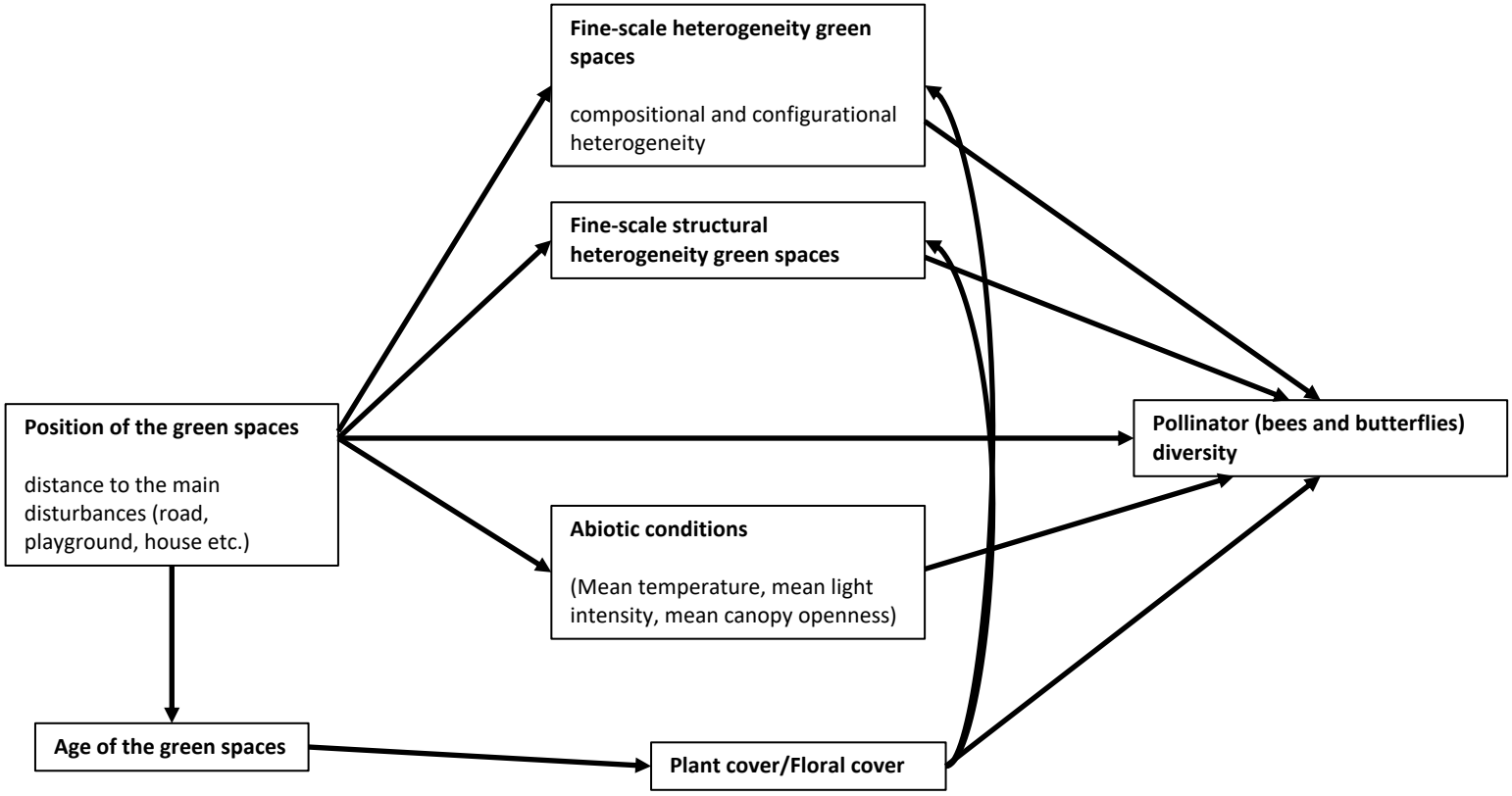


Association between average mosquito predation success dragonfly/damselfly naiads and their body size



Species interaction networks, size of the coloured boxes indicate the frequency of a particular interaction

Project 4: The effects of fine scale heterogeneity in urban green spaces on pollinator communities

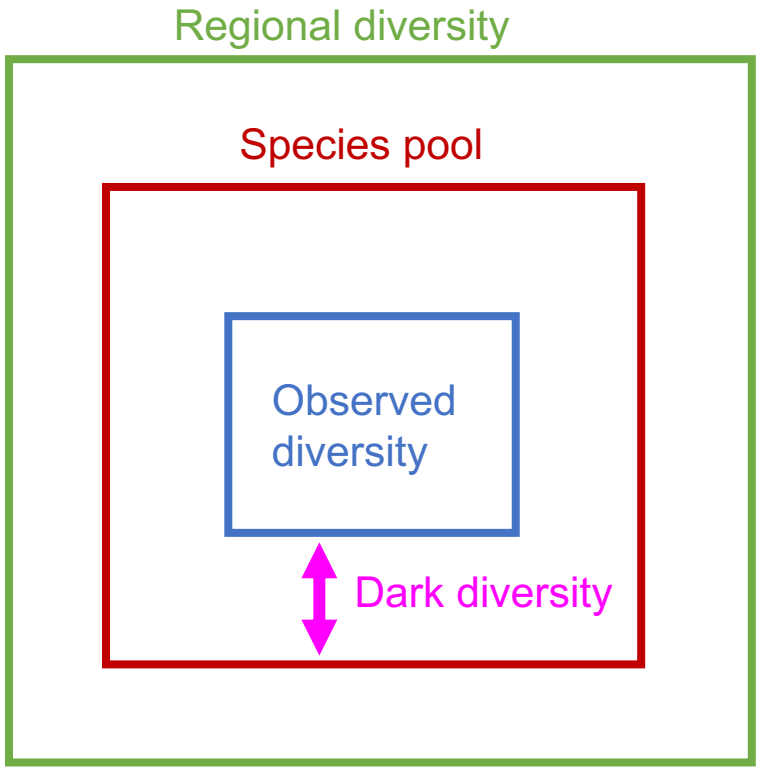


Phillips *et al.*, 2022; *Biological Conservation*
Anderson *et al., 2010; Ecology*

Project 4: The effects of fine scale heterogeneity in urban road verges on butterfly communities

Question: If we increase the heterogeneity (i.e. connectivity and diversity) (or floral cover) in urban road verges will butterflies visit?

"Dark diversity" of butterfly communities in urban road verges



A set of species that are absent from a particular site at a given time

Butterfly diversity in road verges ~ Heterogeneity i.e. connectivity, evenness and richness of plant communities

Dark diversity ~ Dispersal ability related traits Stress-tolerance traits

Hypergeometric method

Carmona & Pärtel, 2020
https://doi.org/10.1111/geb.13203

Project 1: The effects of invertebrates on ecosystem functions and services (data collecting in progress)

Project 2: Pollinator and predator biodiversity benefits from landscape and crop heterogeneity across global farmland – A meta-analysis (waiting for co-authors' comments)

Project 3: Local scale crop compositional heterogeneity suppresses the abundance of *Pieris canidia*, a major pest of cruciferous vegetables (a major revision requested, Basic and Applied Ecology)

Project 4: The effects of fine scale heterogeneity in urban road verges on butterfly communities (yet to start)

Project 5: A meta-analysis reveals that dragonflies and damselflies can provide effective biological control of serious disease vectors (in review, Journal of Animal Ecology)