Hoverflies in Austria: How habitats shape diversity









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Background & Project Objectives

Pollination
(Ollerton 2017)



Regulation
(Burgio et al. 2024)

Decomposition
(Vujić et al. 2022)

Bioindicator
(De Groot et al. 2022)

...but we have knowledge gaps in distribution & ecology (Vujić et al. 2022)

What about Austria?



Background & Project Objectives

Status quo Austria:

- Checklist available
- No Red List
- No standardized data for whole country

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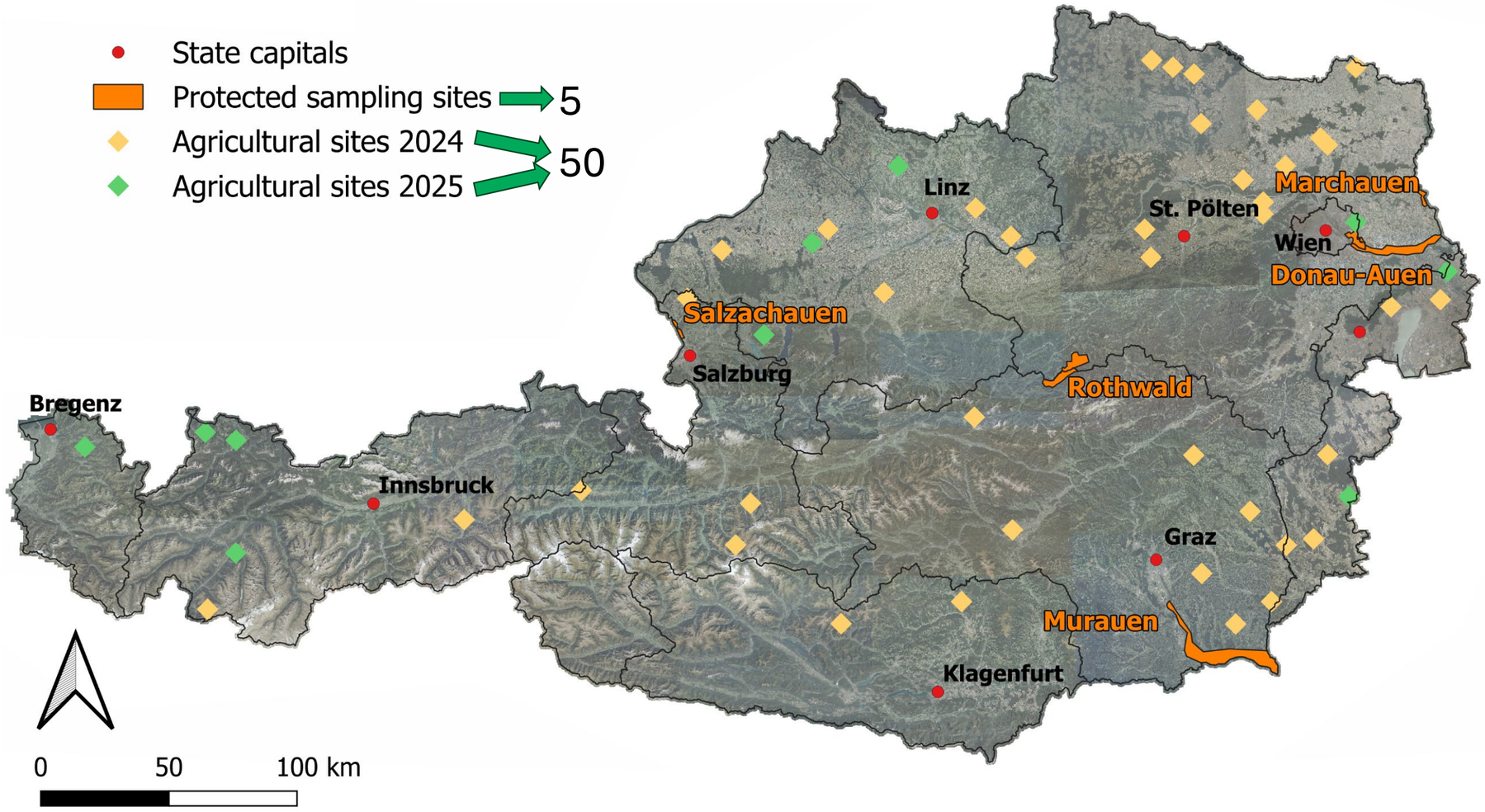
A checklist of the hoverflies (Diptera: Syrphidae) of Austria

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Objectives:

1. Establish a baseline for long-term monitoring in agriculture
2. Assess abundance of *Brachyopa* species, *Hammerschmidtia ferruginea* & other hoverflies at protected sites

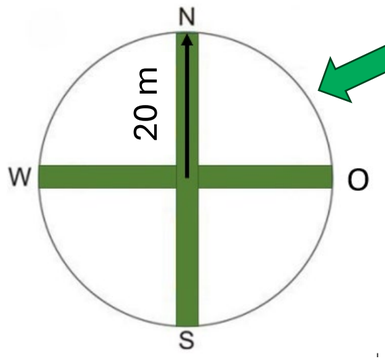
Material & Methods - Overview

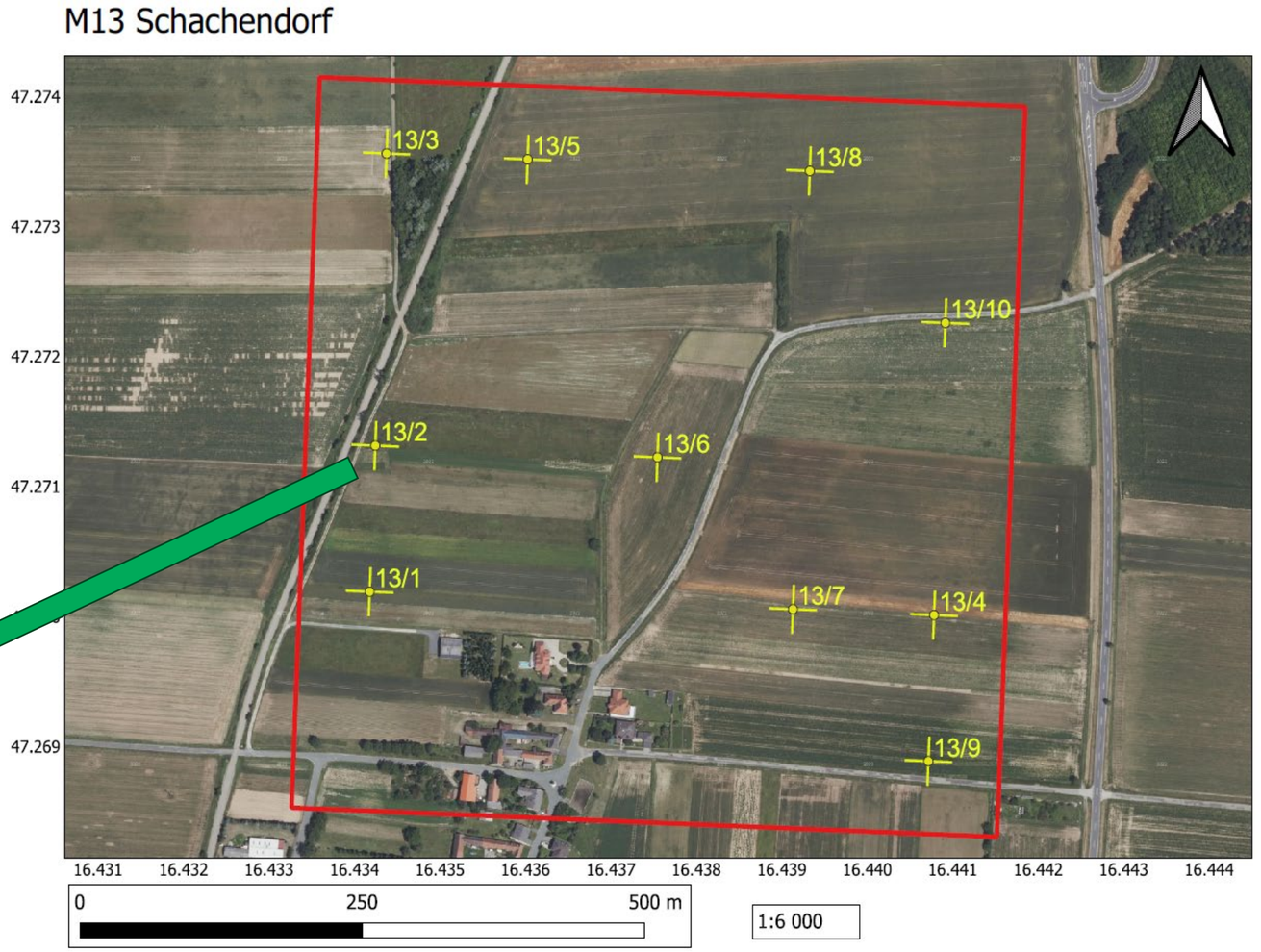


Coordinate system: EPSG:31287
Map source: Geoland Basemap Orthofoto

Material & Methods – Agricultural sites

- **Design:** 10 cross-transects (quantitative) + additional patches (semi-quantitative); 2 or 3 visits per site (April-August) depending on elevation
- **Sampling:** hand net
- **Covariates:** habitat type, plant species





Material & Methods – Protected sites: *Brachyopa* spp., *Hammerschmidtia ferruginea* & other hoverflies

- **Design:** focus on trees with sap-runs; 2 visits per site in April, May & June in 2024 & 2025
- **Sampling:** hand net or aspirator
- **Covariats:** tree genus/species





Results & Discussion - Overview

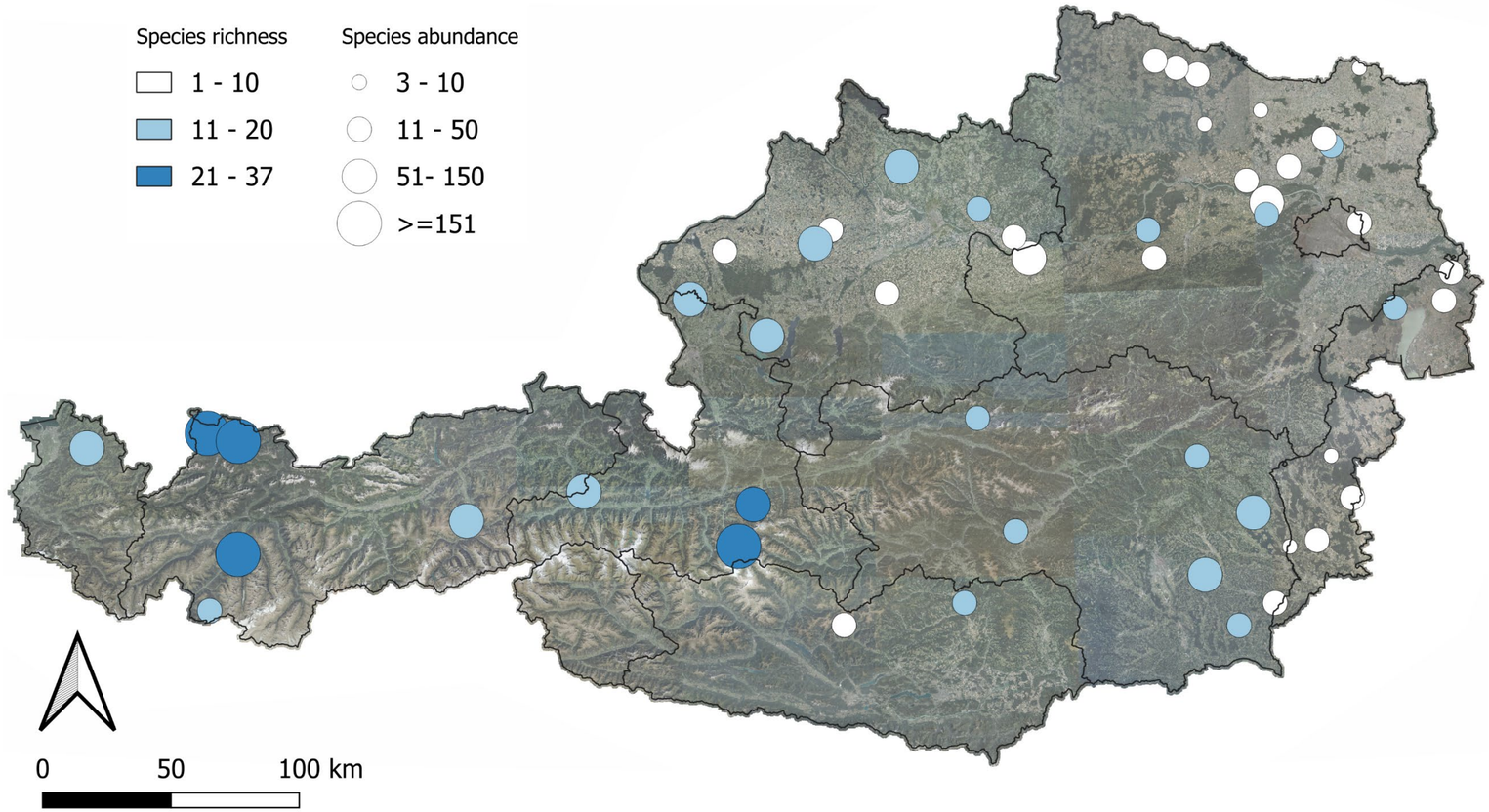
- **195 taxa** (almost 50% of known hoverflies in Austria), >4500 individuals
- **48** hoverfly species **firstly recorded** across several federal states
- **New for Austria**: *Neocnemodon brevidens* (Egger 1865)



Neocnemodon latitarsis © H. Heimburg

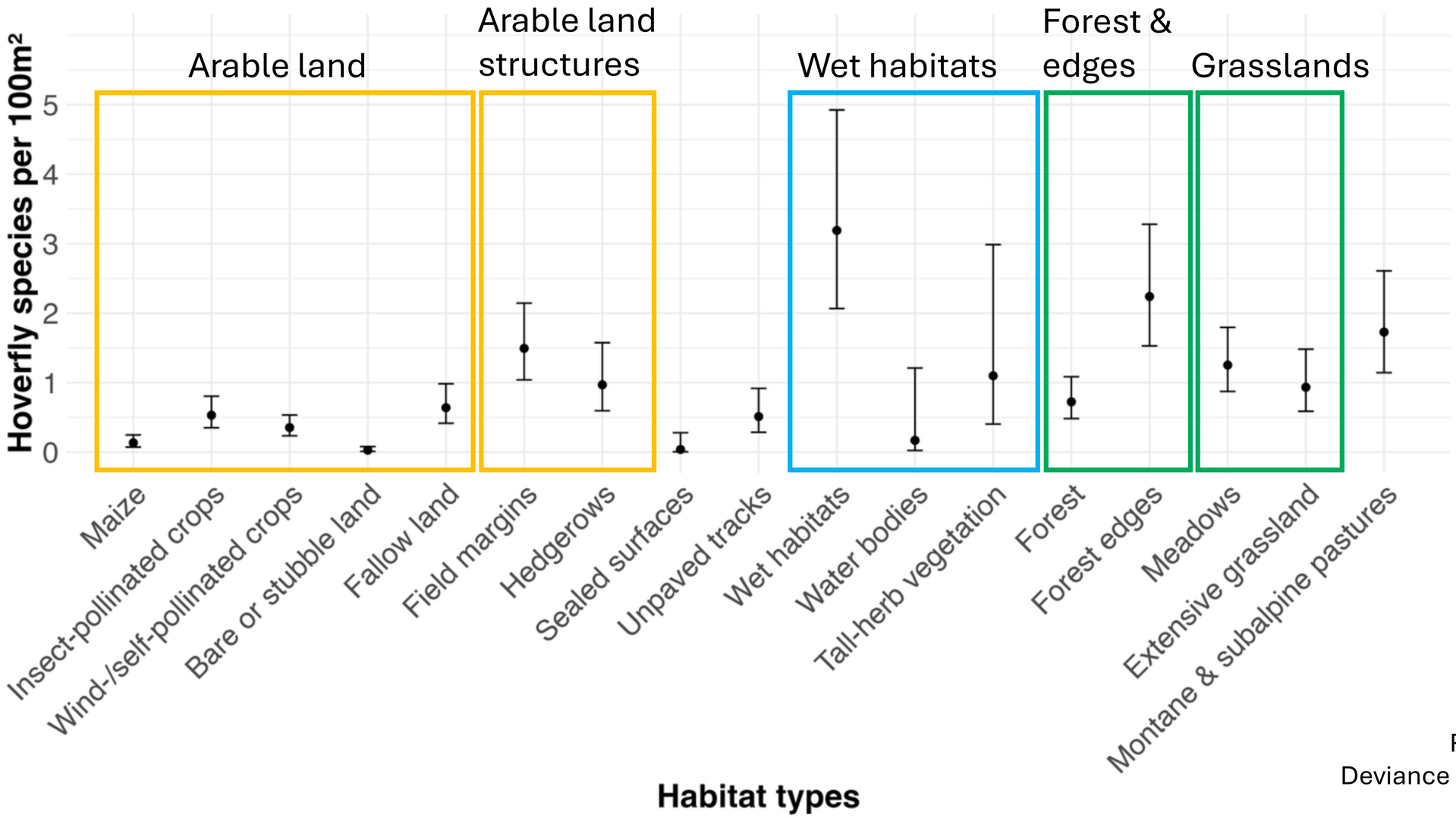
Results & Discussion – Agricultural sites

- 4231 individuals of 122 hoverfly species (28%)
- Common species: *Episyrphus balteatus*, *Sphaerophoria scripta*, *Eristalis tenax*



Coordinate system: EPSG:31287
Map source: Geoland Basemap Orthofoto

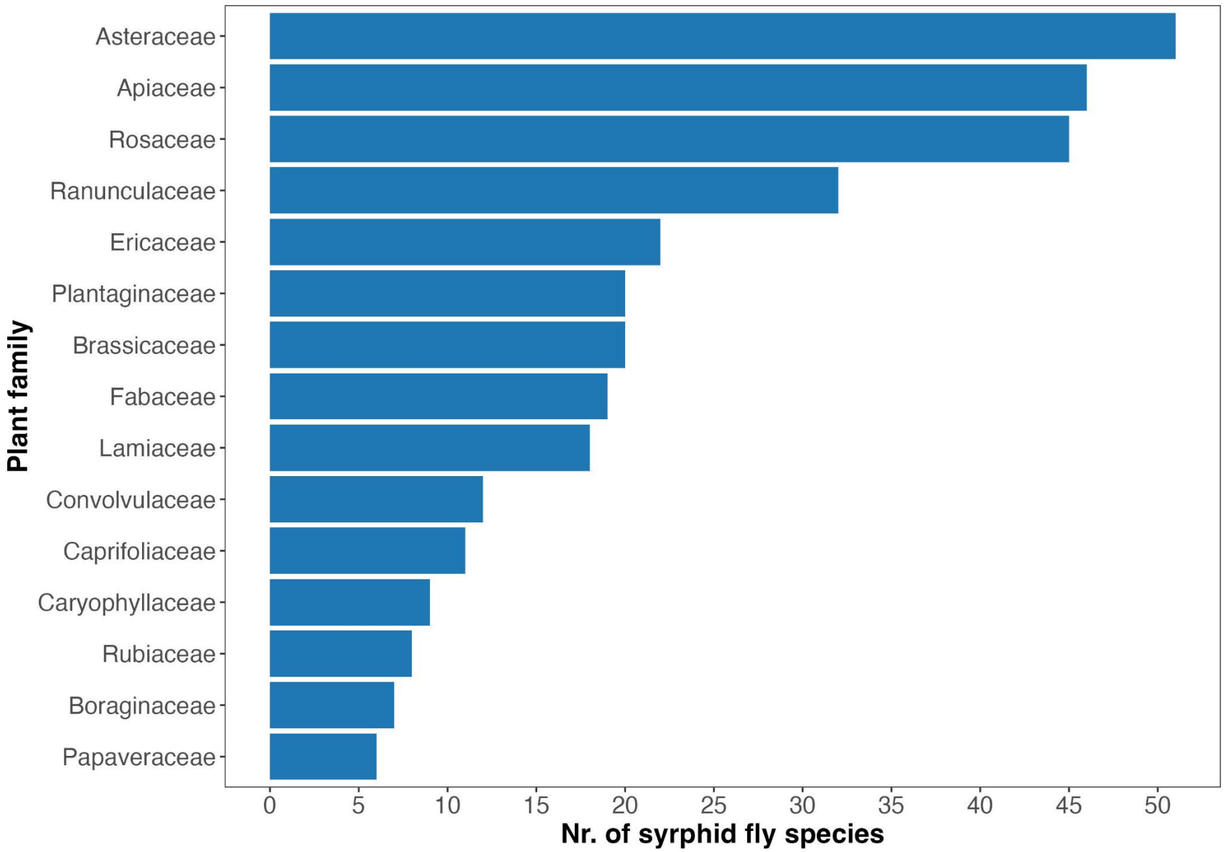
Results & Discussion – Agricultural sites

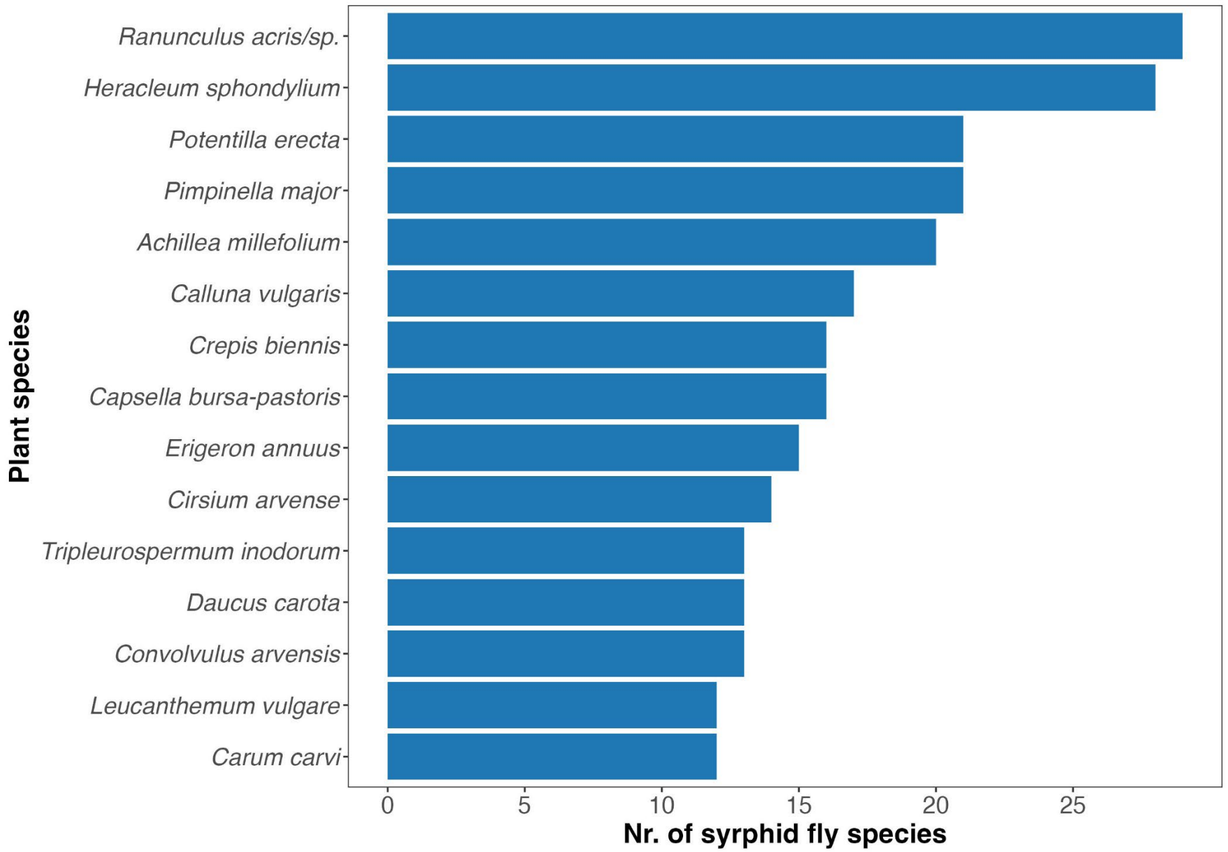


$p < 0.001$
R-sq. (adj.) = 0.729
Deviance explained = 69.8%

Schwender et al. in prep.

Results & Discussion – Agricultural sites



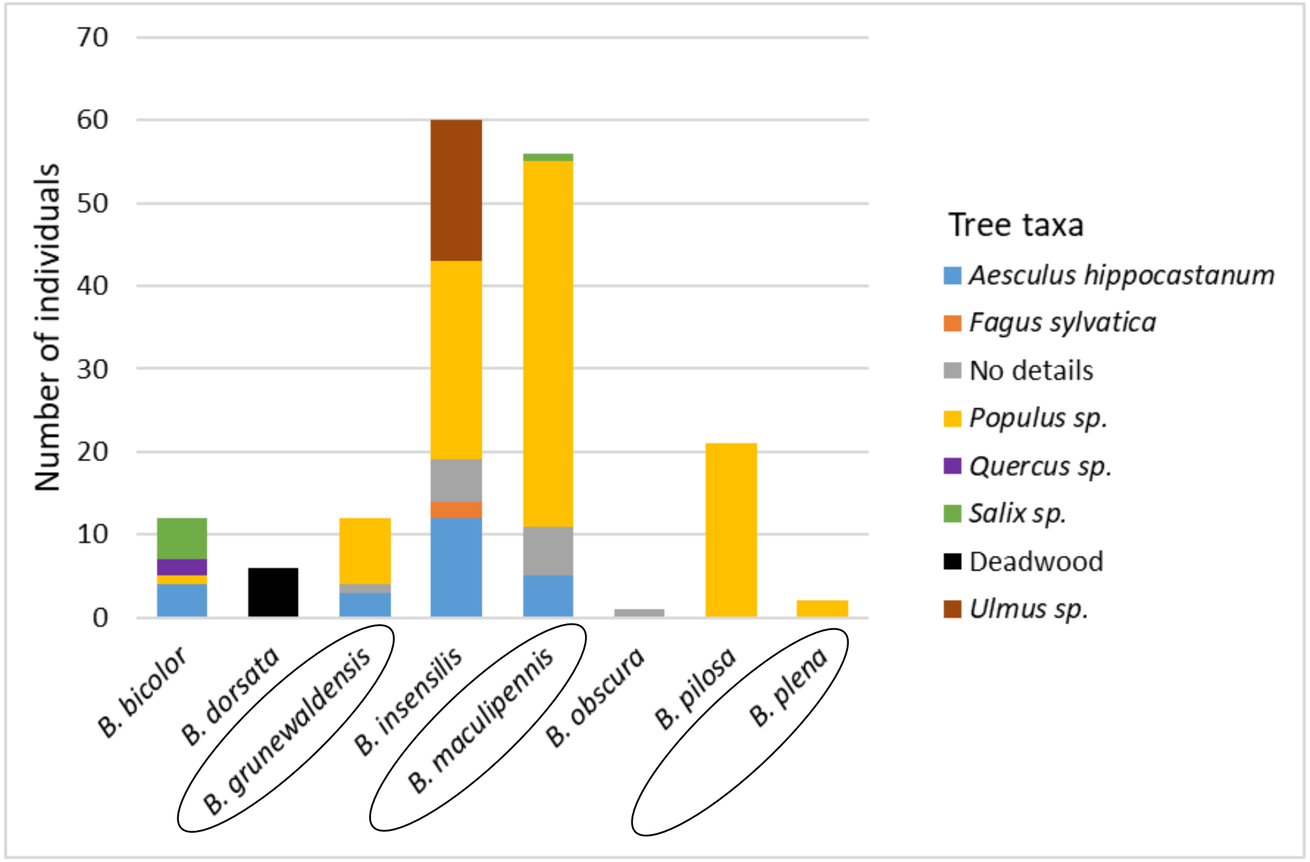


Results & Discussion – Protected sites: *Brachyopa* spp., *Hammerschmidtia ferruginea* & other hoverflies

- **8 of 13** known *Brachyopa* species
- Recorded further 140 hoverfly species
- No *Hammerschmidtia ferruginea*


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Key outcomes & Future Research

- New insights into species **distributions & ecology**
- Baseline for **monitoring** in Austria
- Identified habitats & plants with high/low species richness, facilitating targeted **conservation measures**
- Most *Brachyopa* species frequently visited sap-runs of *Populus* spp., highlighting a **key resource**

Next steps:

- Testing effects of abiotic & biotic drivers on species diversity
- Assess how farming systems (e.g. organic vs. conventional) influence species diversity
- Comparison of species richness & habitat requirements of hoverflies + wild bees

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