Università Ca' Foscari Venezia

Dipartimento di Scienze Ambientali Informatica e Statistica

The influence of flower strip structure on the abundance of different arthropod functional groups

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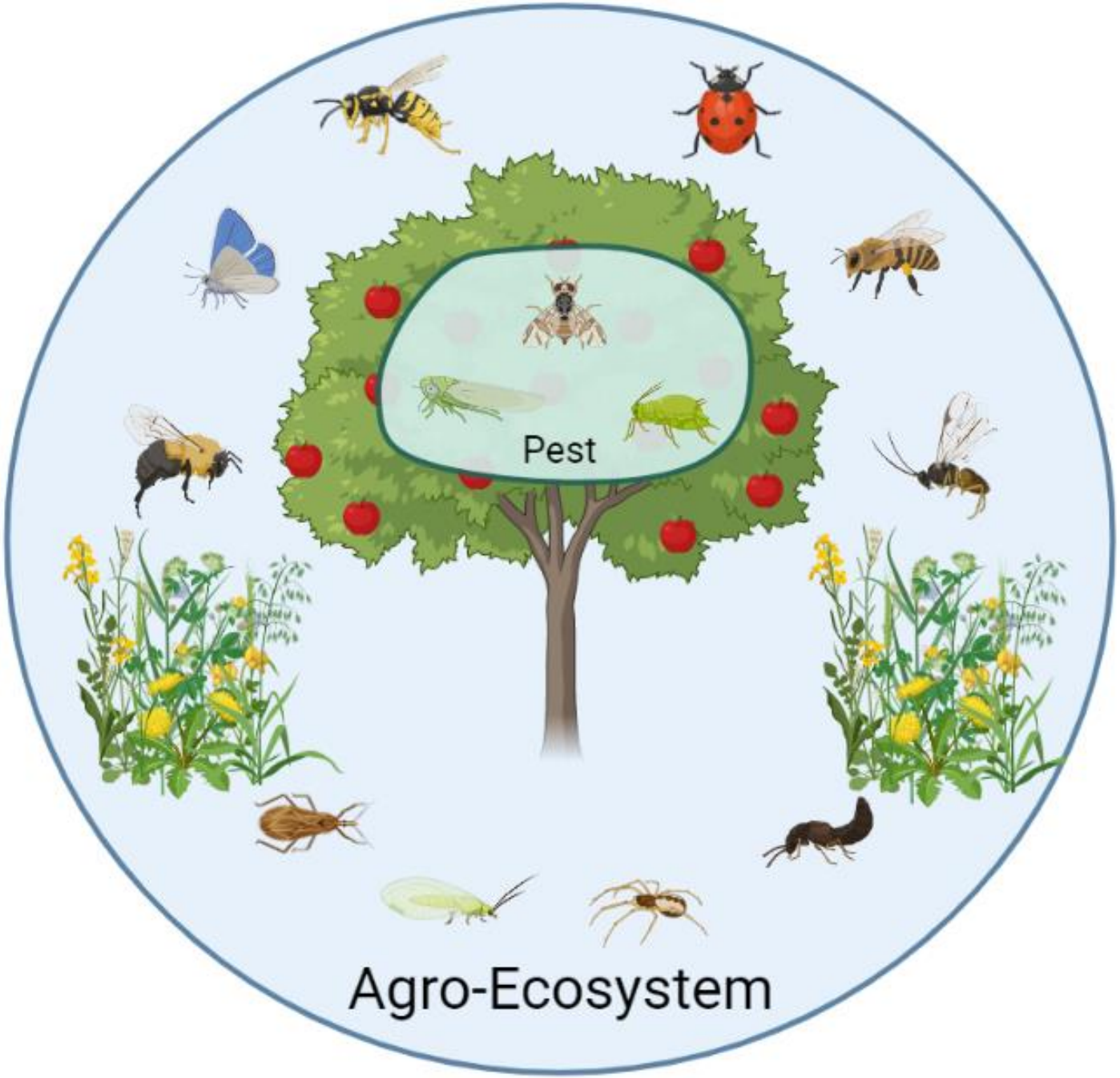
Ecological intensification has been proposed as strategy to conserve and restore ecosystem services in agroecosystems.

Two of the most important ecosystem services are:

- **Pollination;**
- **Pest control.**



Flower strips in the agricultural landscape are supposed to ensure:

- Trophic resources for pollinators;

But also:

- Nesting sites;
- Overwinter refugee;
- Alternative preys.

Functional groups:

- Herbivores ⇨ **pest arthropods**;
- Predator and parasitoids ⇨ **pest control**;
- Detritivores ⇨ **nutrients cycling**;
- Pollinators ⇨ **pollination**.

Little information about the relationship between composition and structure of flower strips with the presence of arthropod functional groups.

1. Do annual flower strip interrows, created for pollinators, support other arthropod functional groups?
2. Does the structure of annual flower strip interrows influence the abundance of different functional groups arthropods?

Our Studying system:

- Organic apple orchard situated in North Italy, Caldiero (VR);
- Interrows covered with commercial seed mixture of annual flower strips to attract pollinators;
- Flower strips were sown in March and ploughed in May of the same year.

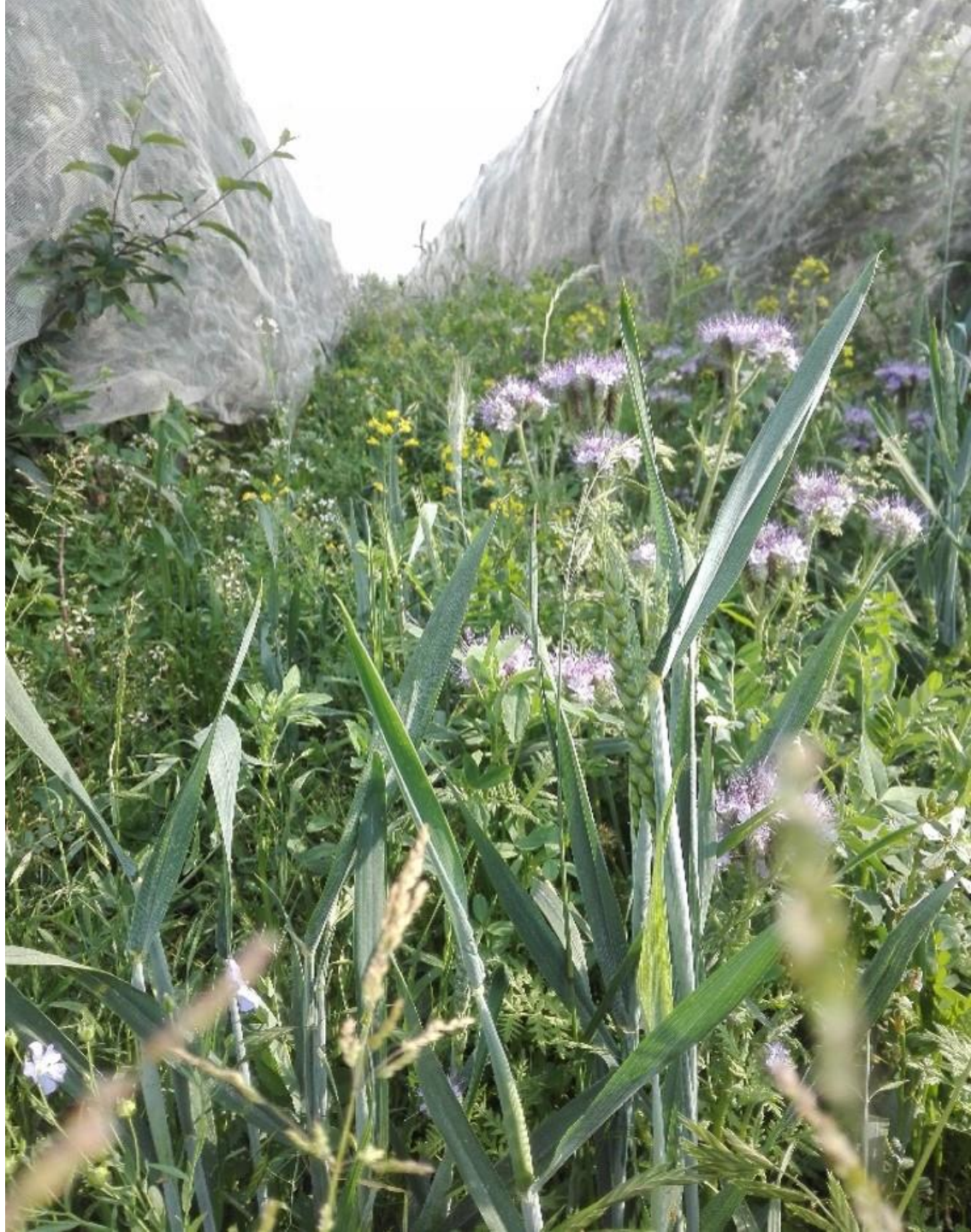
Sampling design:

30 monitoring transects of 1 m x 6 m (6 plots of 1 m x 1 m per each transect) on annual flower strip interrows.

Vegetation sampling:

In each transect:

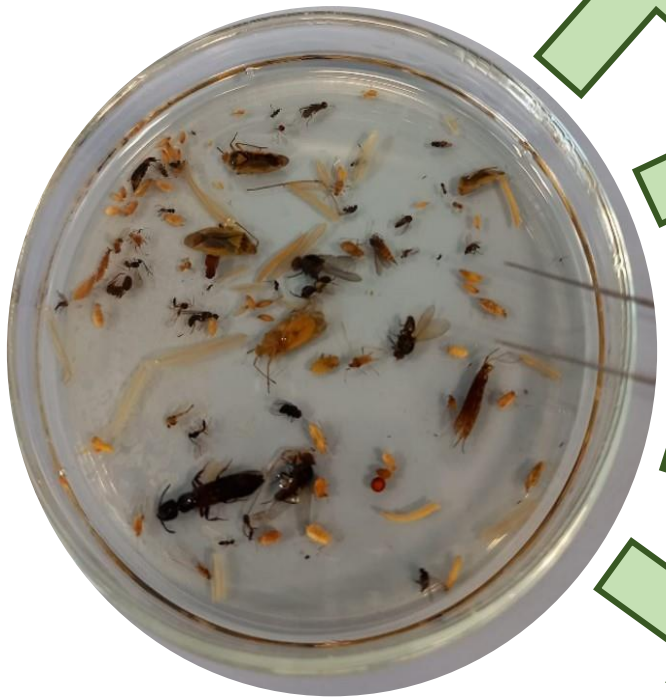
- Total vegetation cover (%) (**COV%**);
- Richness of plant species (**SR**);
- Average vegetation height (cm) (**H**);
- Leaf area index on the ground (**LAI**);
- Total number of floral displays of entomophilous plant species (**NFD**).



Arthropod community sampling:

Sampling

Sorting



Functional groups

Parasitoid

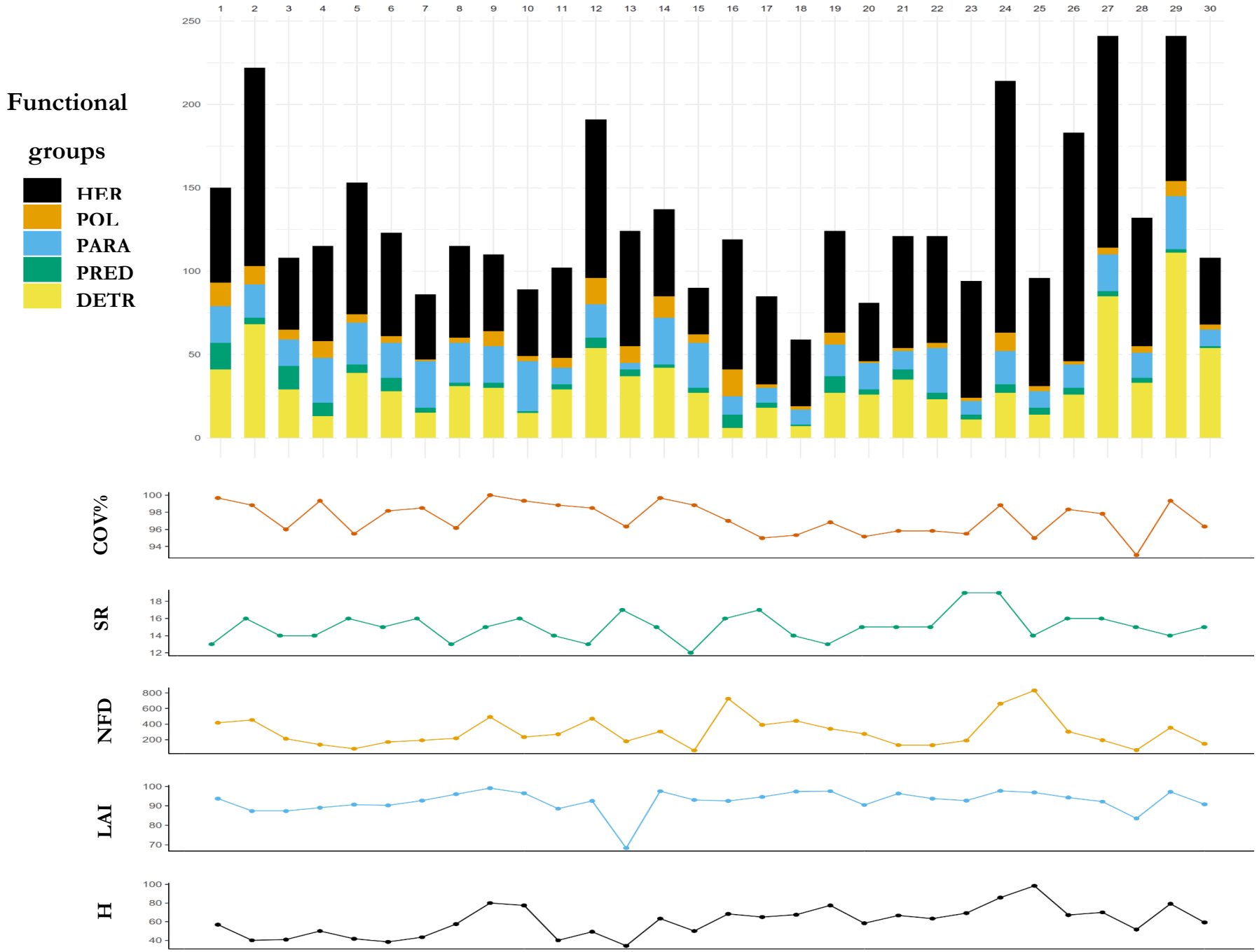
Predator

Herbivore

Pollinator

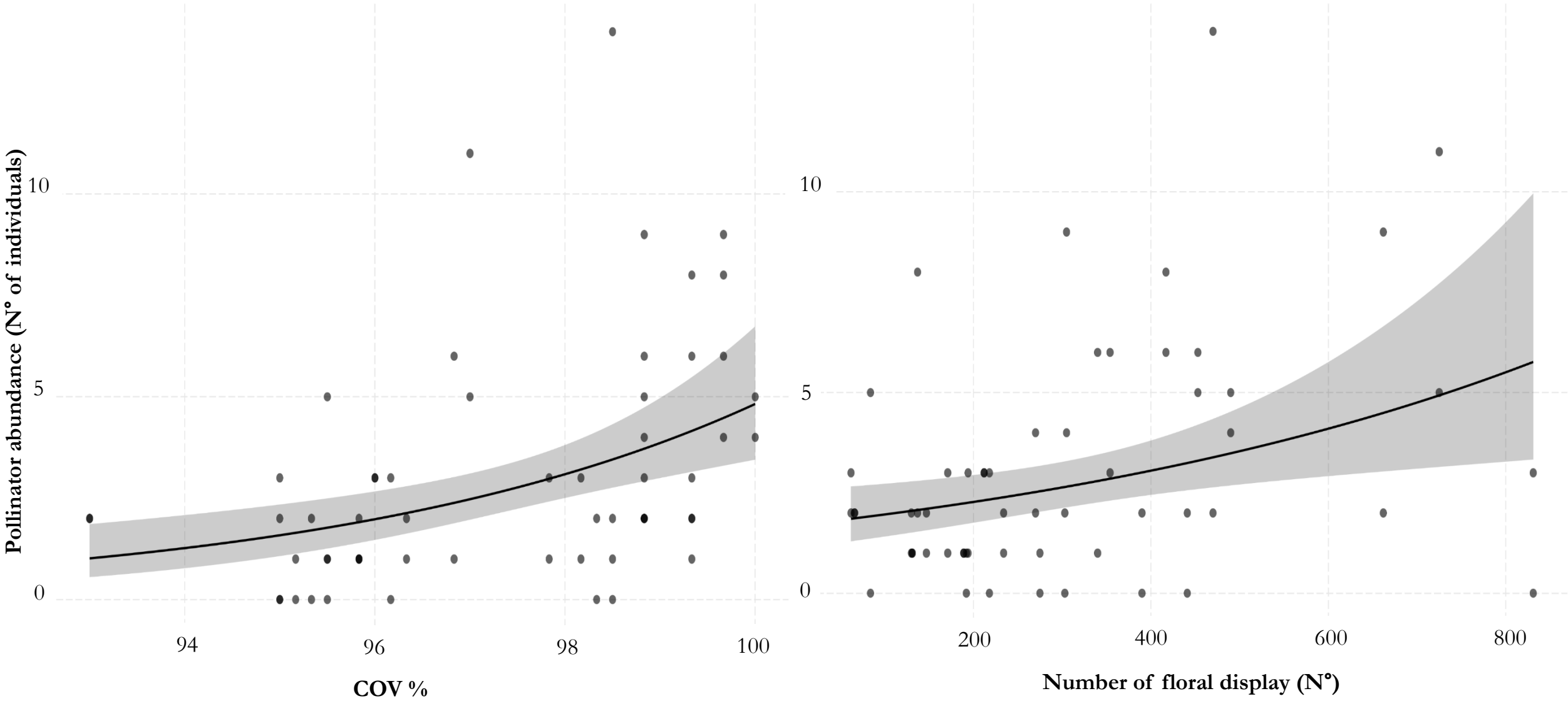
Detritivorous

1. Do annual flower strip interrows, created for pollinators, support other arthropod functional groups?



2. Does the structure of annual flower strip interrows influence the abundance of different functional groups arthropods?

Dependent variable	Predictor variable	χ^2	P-value
Pollinator abundance	Vegetation cover (%)	< 0.001	<0.001
Pollinator abundance	N° floral displays	< 0.05	<0.05



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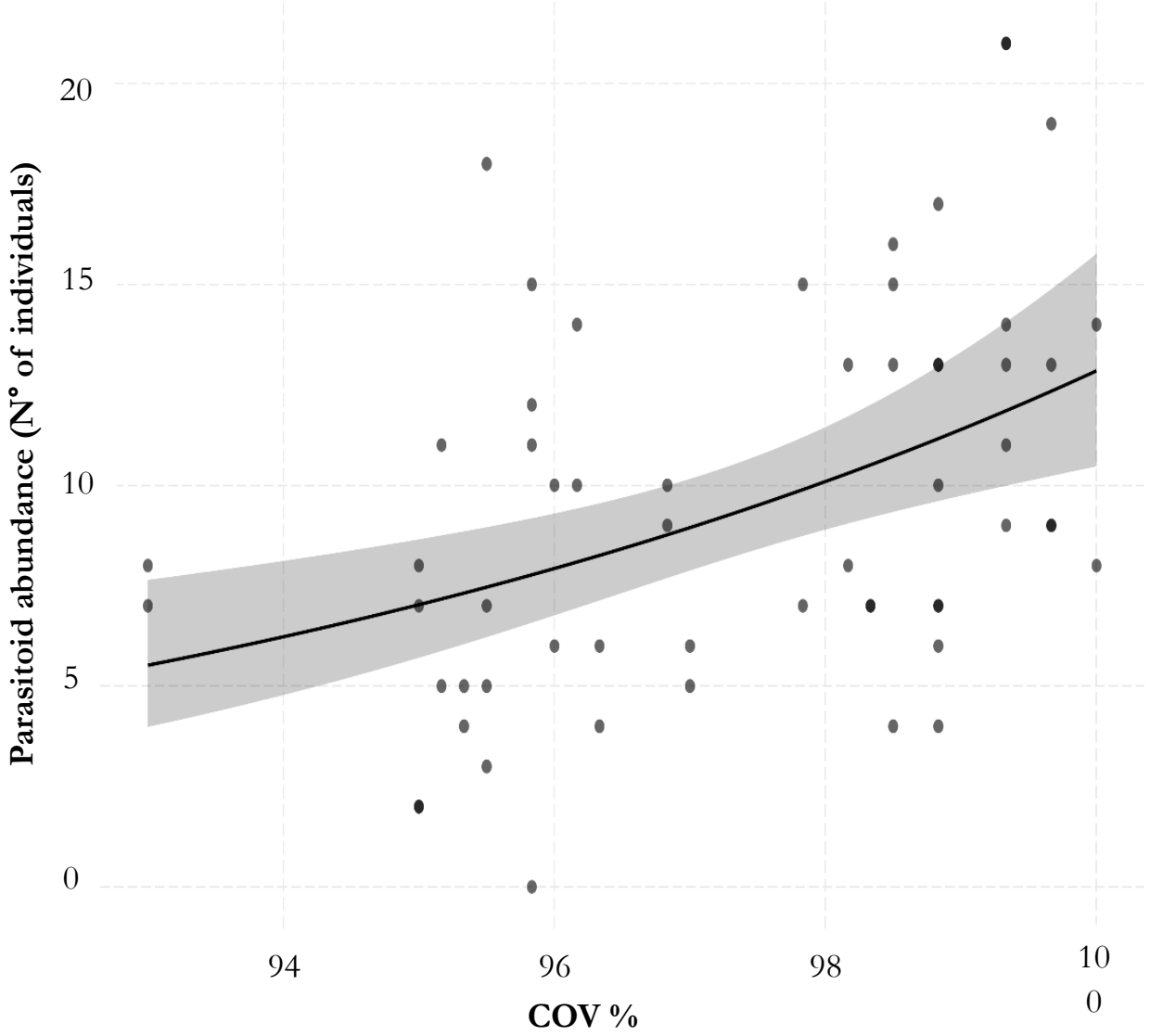
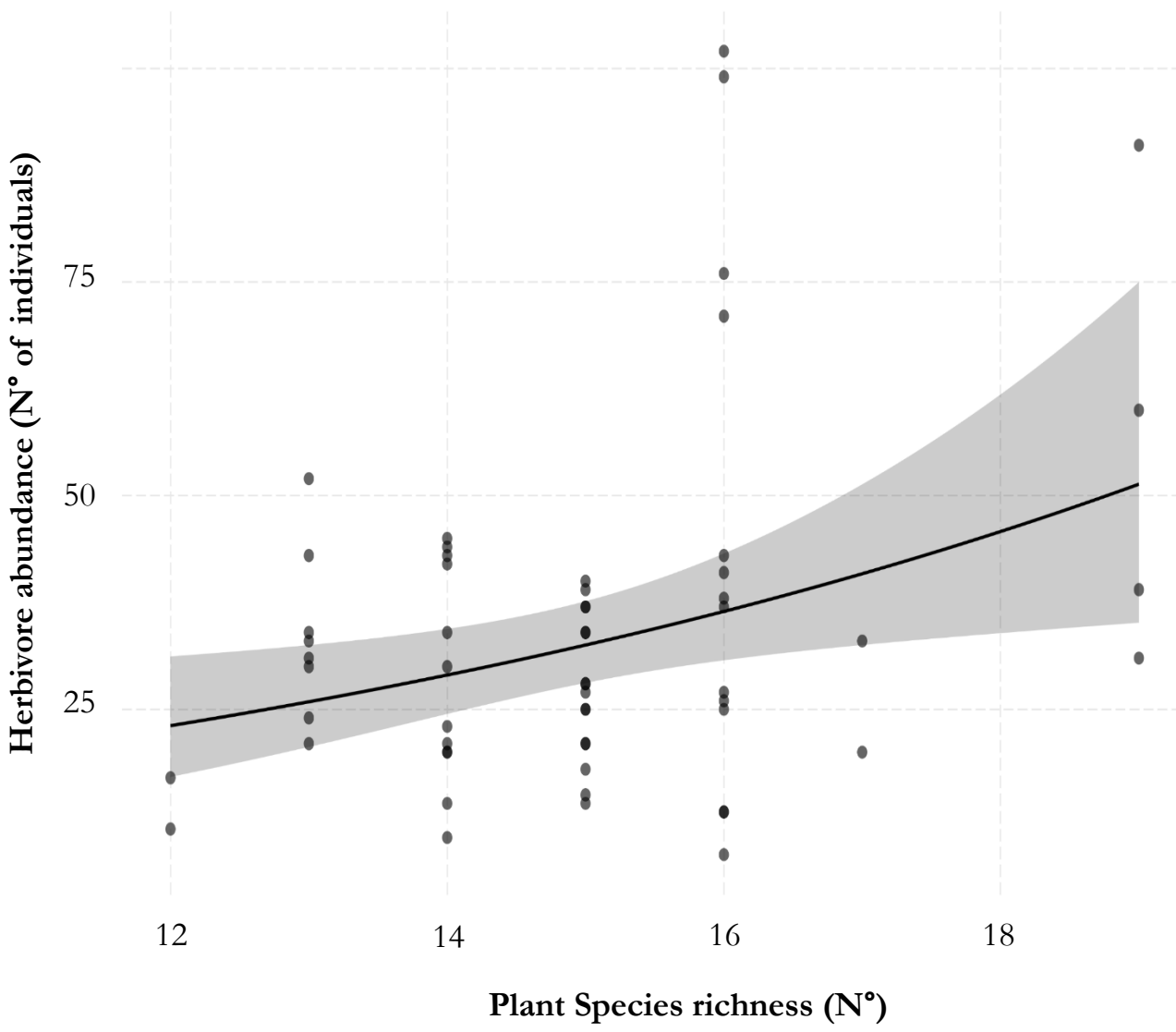
Dependent variable	Predictor variable	χ^2	P-value
Parassitoid abundance	Vegetation Cover (%)	< 0.001	<0.001
Herbivore abundance	Species richness	< 0.05	<0.05





- Presence of all arthropod functional groups but with differences in abundance.

- Vegetation structure has a influence to different functional groups;
- Predators and detritivores are not related to vegetation parameters;
- Annual strips (annual plant species & management).

Further investigations:

- Annual flower strips vs perennial flower strips;
- Commercial plant species vs native plant species;
- Relation between arthropod functional groups and plant species morphological traits.

Thank you for your attention