Urban sprawl in intensive agricultural land: abundance of pollinators benefits from urban green spaces

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1 Introduction

- In the debate on the **impact of urbanisation** on **biodiversity**, two characteristics of urbanisation have been identified that mainly determine the extent of the impact, namely the **level of urbanisation** and the **landscape context**.
- More recently, it has been hypothesised that **urban sprawl** in an **intensive agricultural landscape** has a **positive influence** on **pollinators** by **increasing habitat** and **resource** availability.
- We empirically tested this hypothesis to **understand** the **response** of **pollinator communities** and **plant-pollinator interactions** to the **landscape context** along an **urbanisation gradient**, associated with **urban sprawl** in an **intensive agricultural land**.

How do attributes of landscape composition and configuration influence pollinator richness and visits?

2 Study Area

Po Plain
Veneto Region
Italy

N° of sampling sites
15

8 municipalities

4 organic farms

3 road infrastructures

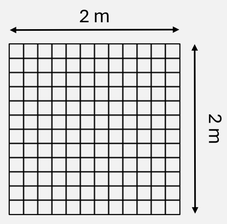
3 Materials & Methods

Observation plot in **April**, **July**, and **September** 2022

N° of observation plot = **39**

8 min between **8 a.m.** and **1 p.m.**

8 min between **1 p.m.** and **6 p.m.**



Landscape composition and configuration

- Cover and number of patches of:
  - Impervious surfaces
  - Intensive agricultural land
  - Urban green spaces
  - Semi-natural areas
  - Water bodies
- Landscape heterogeneity

Pollinator community attributes

- Pollinator richness
- Number of visits

Plant community attributes

- Richness of plant species in bloom
- Number of floral displays

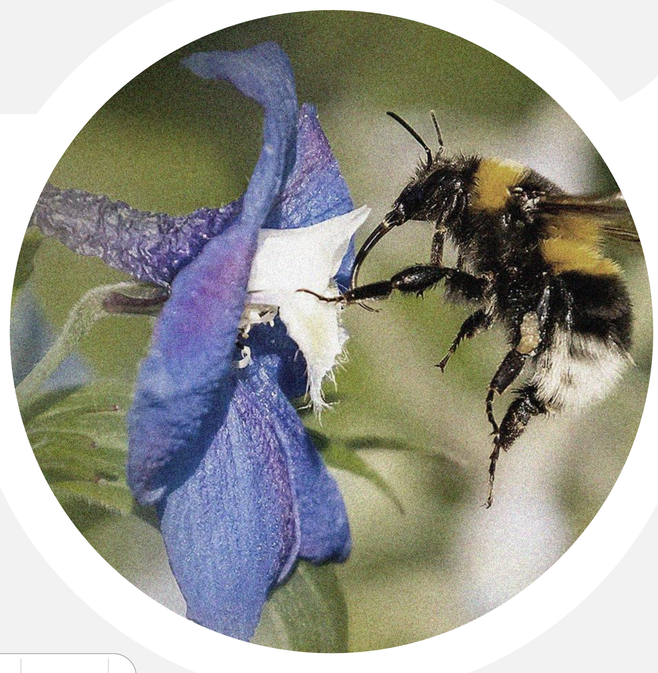
Statistical analysis

GLMMs

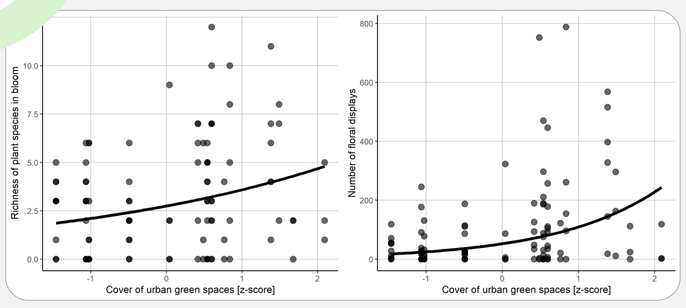
- Dependent variables:
  - **Richness** of **plant species** in bloom
  - **Number** of **floral displays**
- Independent variables:
  - **Landscape composition** and **configuration**

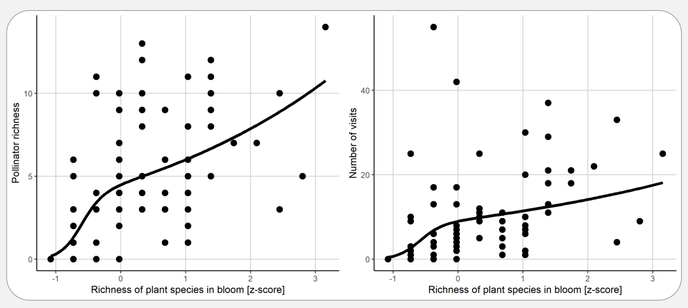
Zero inflated models

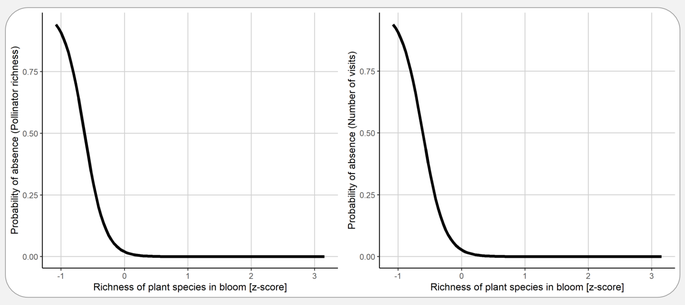
- Dependent variables:
  - **Pollinator richness**
  - **Number** of **visits**
- Independent variables:
  - **Landscape composition** and **configuration**
  - **Plant community attributes**

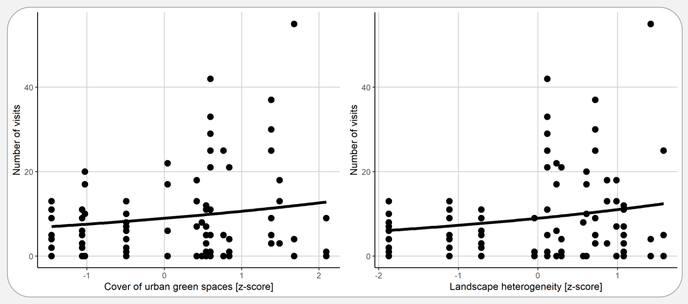


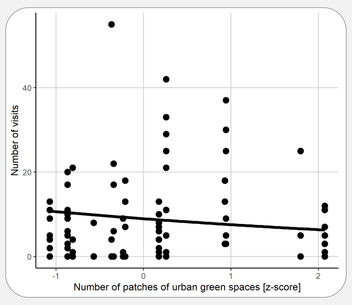
4 Results











Pollinator abundance, not the richness, benefits from urban green space proportion

1. **No relationship** exists between **urban sprawl** and **pollinator species richness**.
2. **Urban sprawl benefits pollinator visits** by **improving flowering communities**.
3. **Semi-natural areas** become **irrelevant** when their **cover** is **very low**.

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