3rd Asian Ornithological Conference (AOC2026)

Urban plants shape plant–bird frugivory interaction networks in urban green spaces

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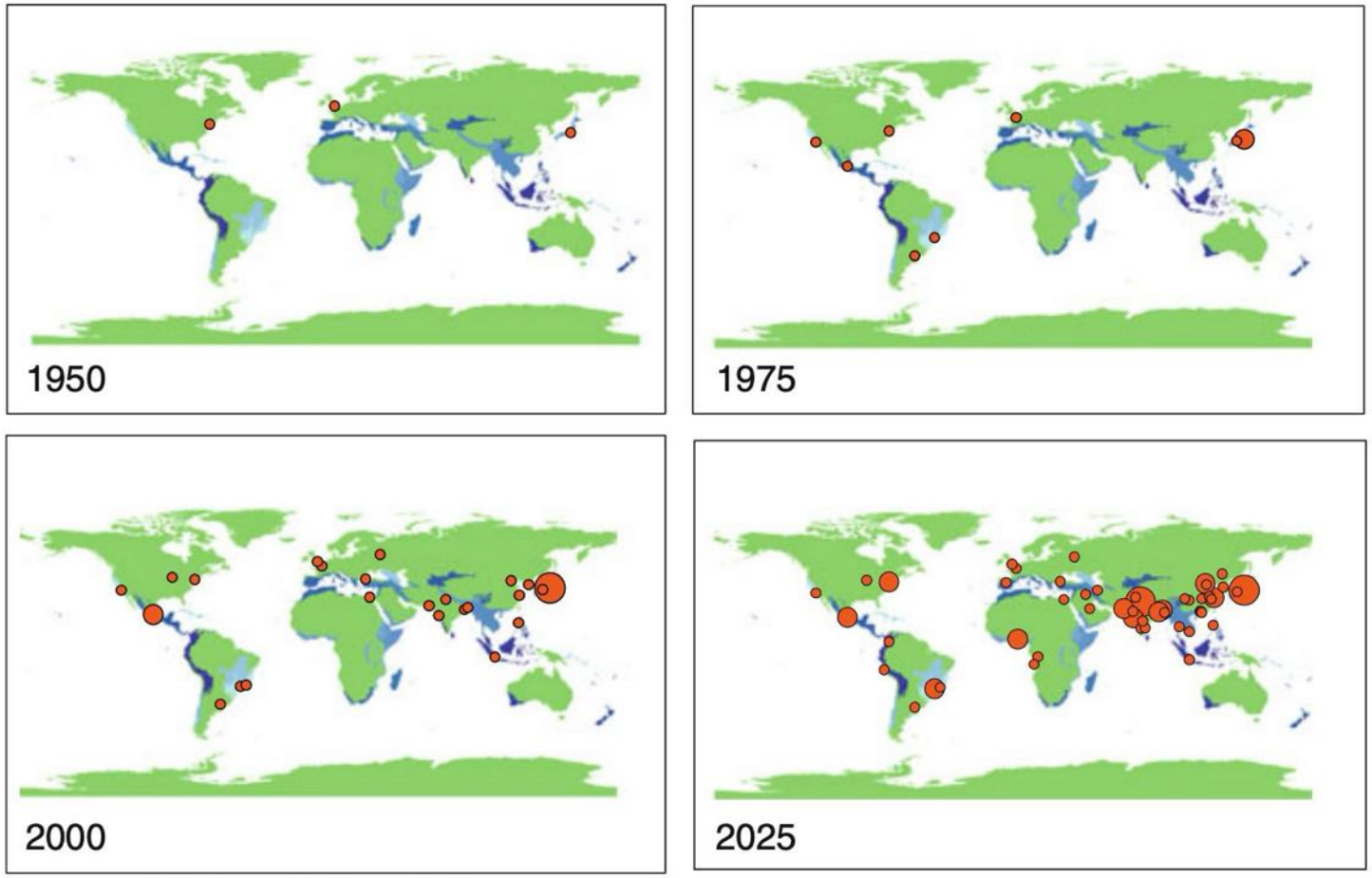
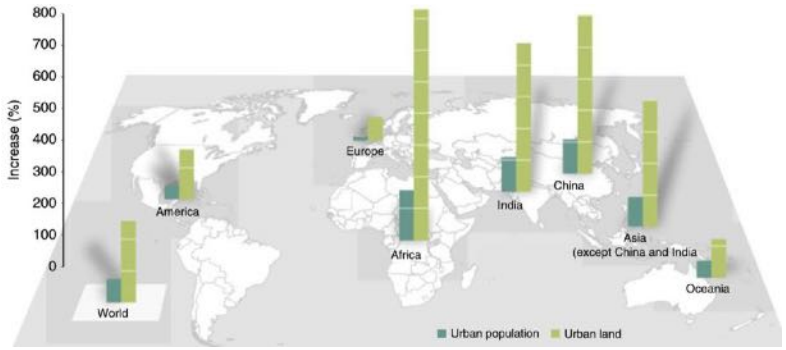
Singapore，2026-11-16

Urbanization is reshaping global biodiversity

Global urbanization and biodiversity hotspots



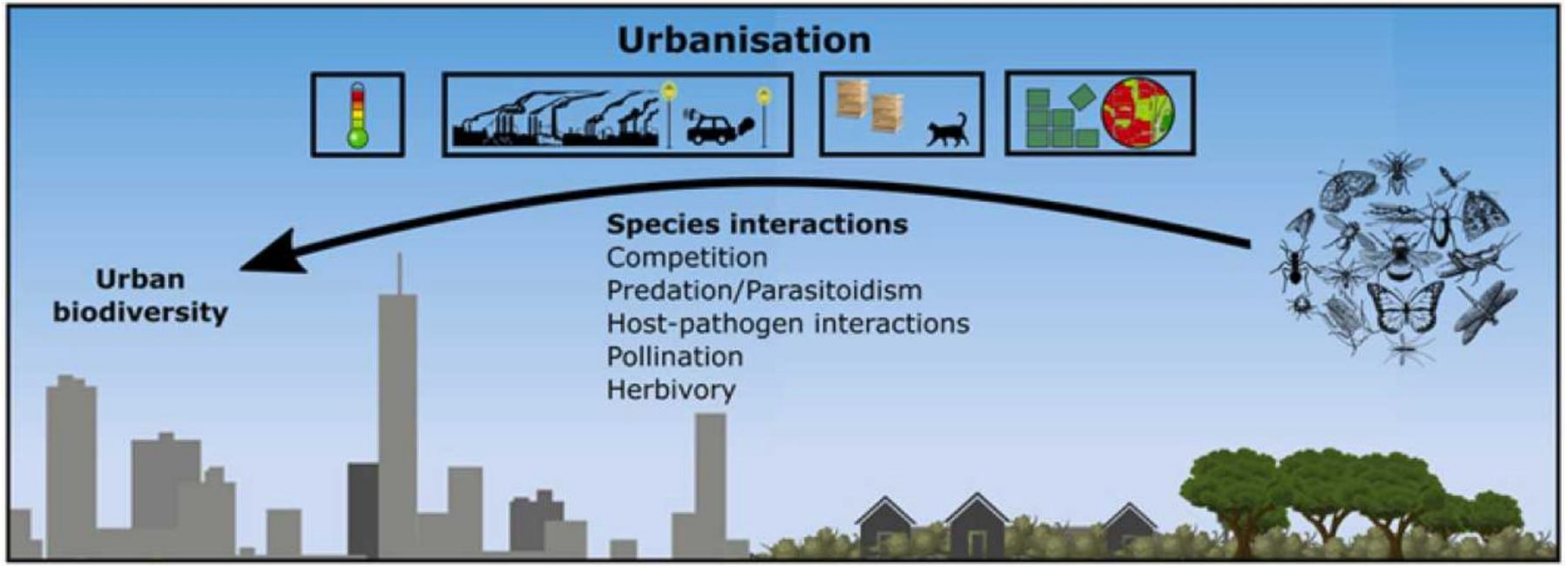




One of the main drivers of global biodiversity loss

Seto et al. 2012, Seto et al. 2013

Urbanization affects not only species, but also their interactions

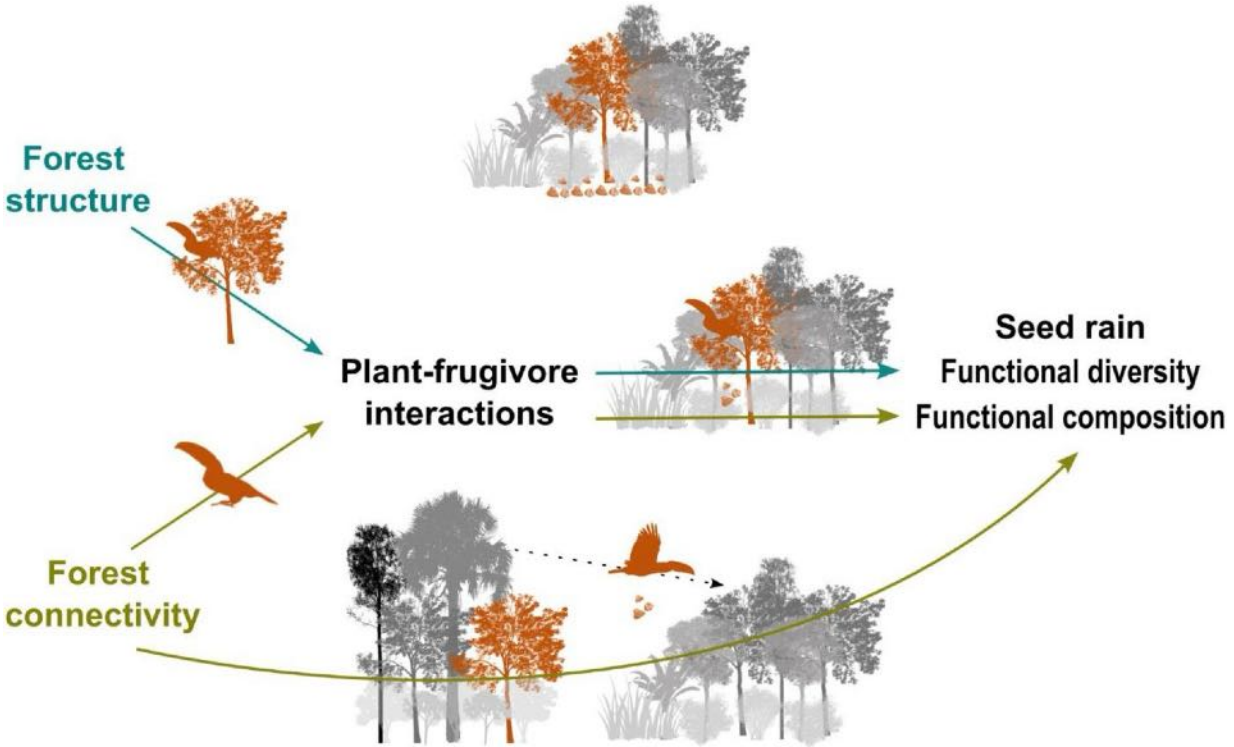


Species interactions are also important!

Theodorou 2022

Plant–bird frugivory interactions are important to urban ecosystems





A critical mutualistic species interaction

Important for biodiversity conservation

Mendes et al., 2025

Urban greening reshapes plant communities



Non-landscape plants



Landscape plants

Liu et al., 2025, Li et al., 2025

Landscape plants may differ in their fruit resource patterns



Non-landscape plants



Landscape plants

limited diversity
synchronized fruiting phenology
spatially clustered distributions

Liu et al., 2025, Li et al., 2025

Scientific questions

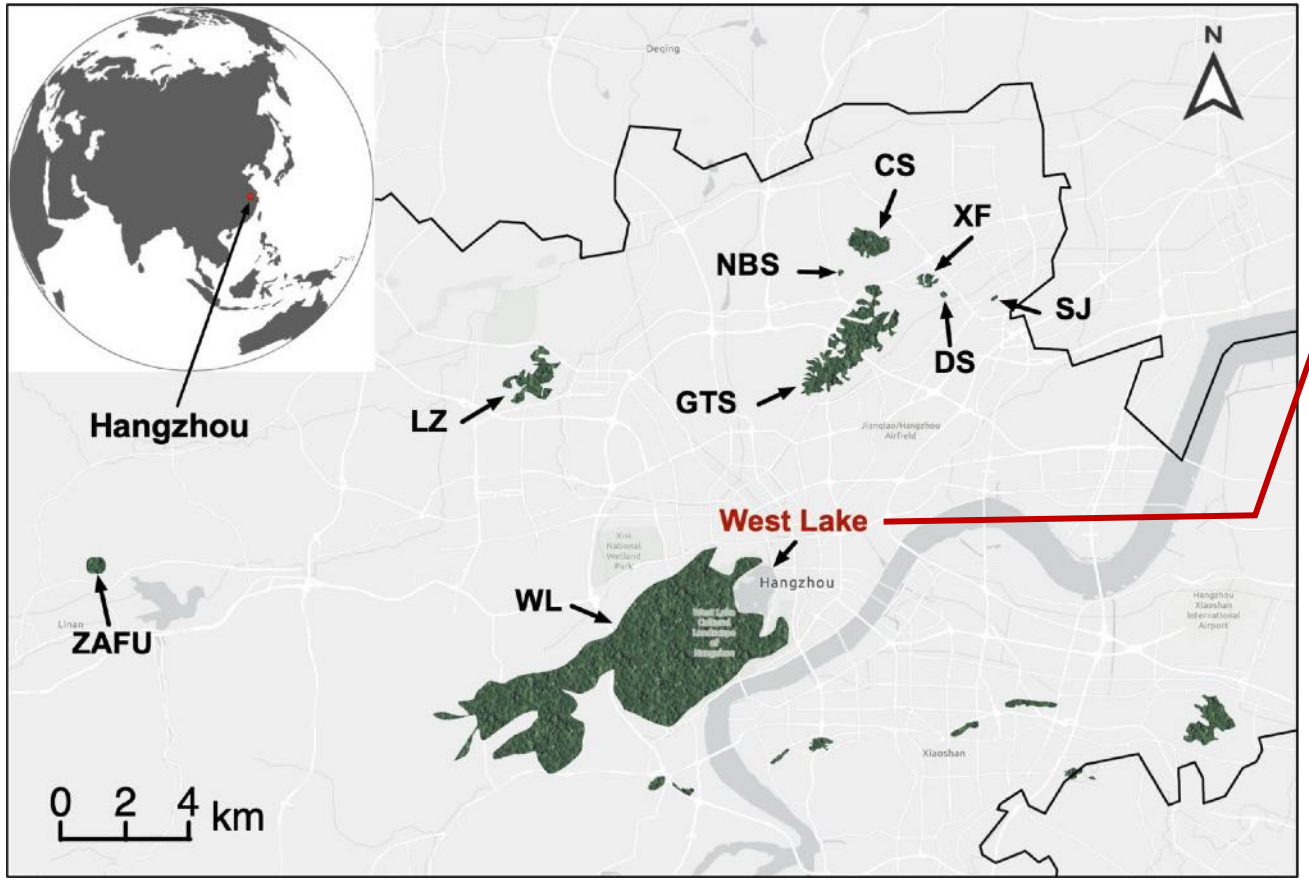
1. Do different urban plants support different interaction networks?

Scientific questions

1. Do different urban plants support different interaction networks?
2. Do birds play different structural roles in these networks?

Study site

Hangzhou, China



There is a paradise in heaven, while there are Suzhou and Hangzhou on earth



- Selecting nine urban green spaces
- From May 2024, to January 2025 (nine months)
- 30 fleshy-fruit plants

Monitoring plant–bird frugivory interactions

Arboreal camera traps

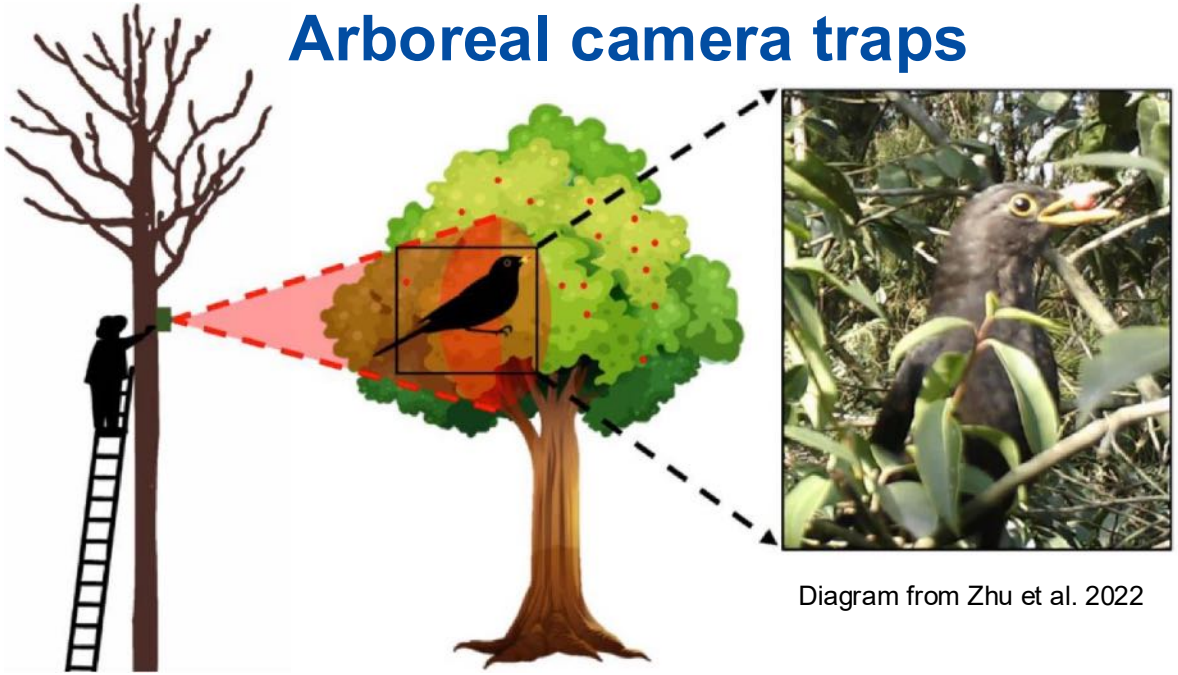
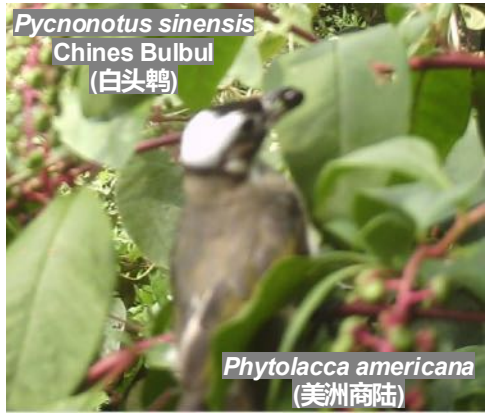


Diagram from Zhu et al. 2022

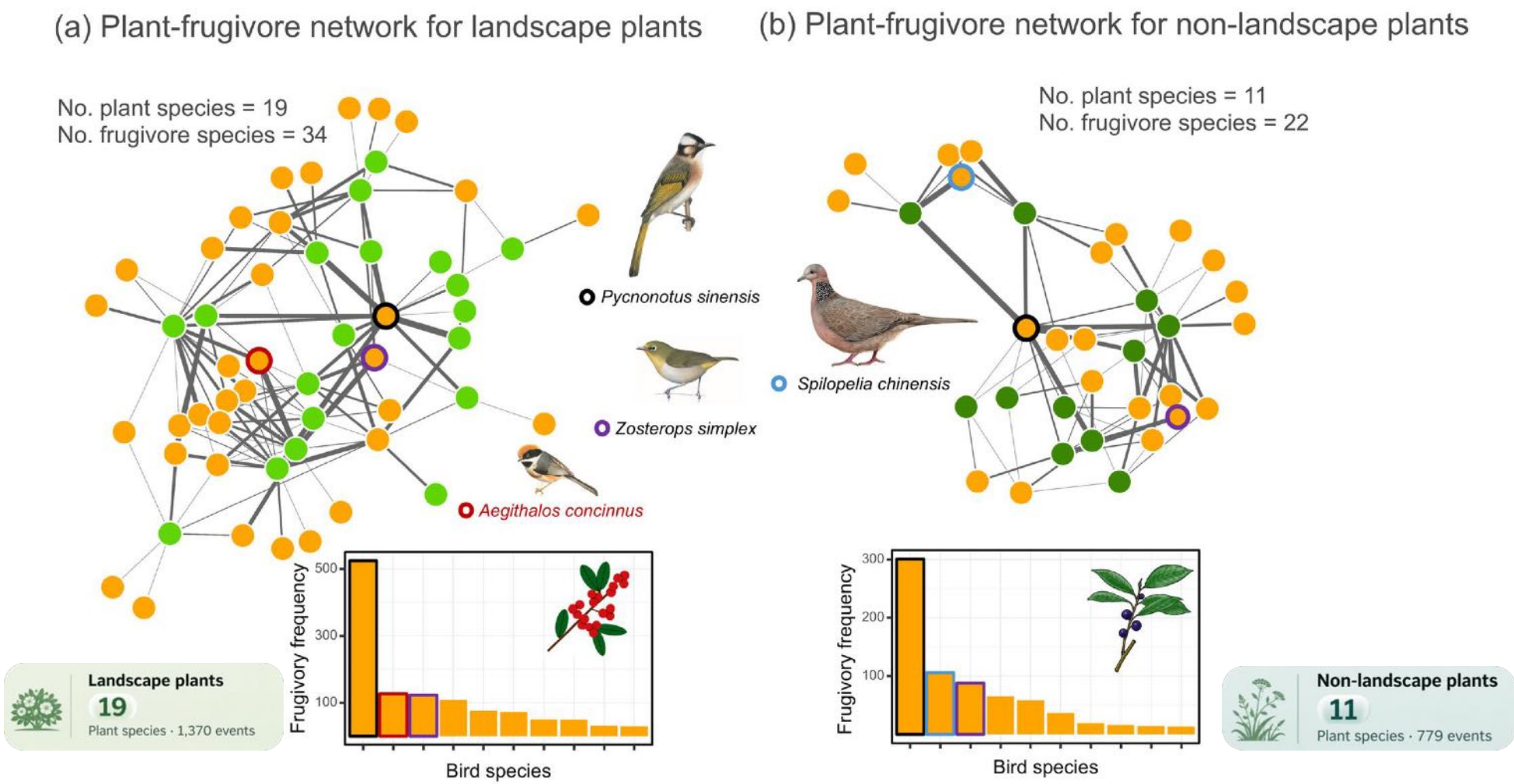
- Camera monitoring
- Interaction networks
- Network analyses







Result1: Landscape and non-landscape plants support distinct frugivory networks



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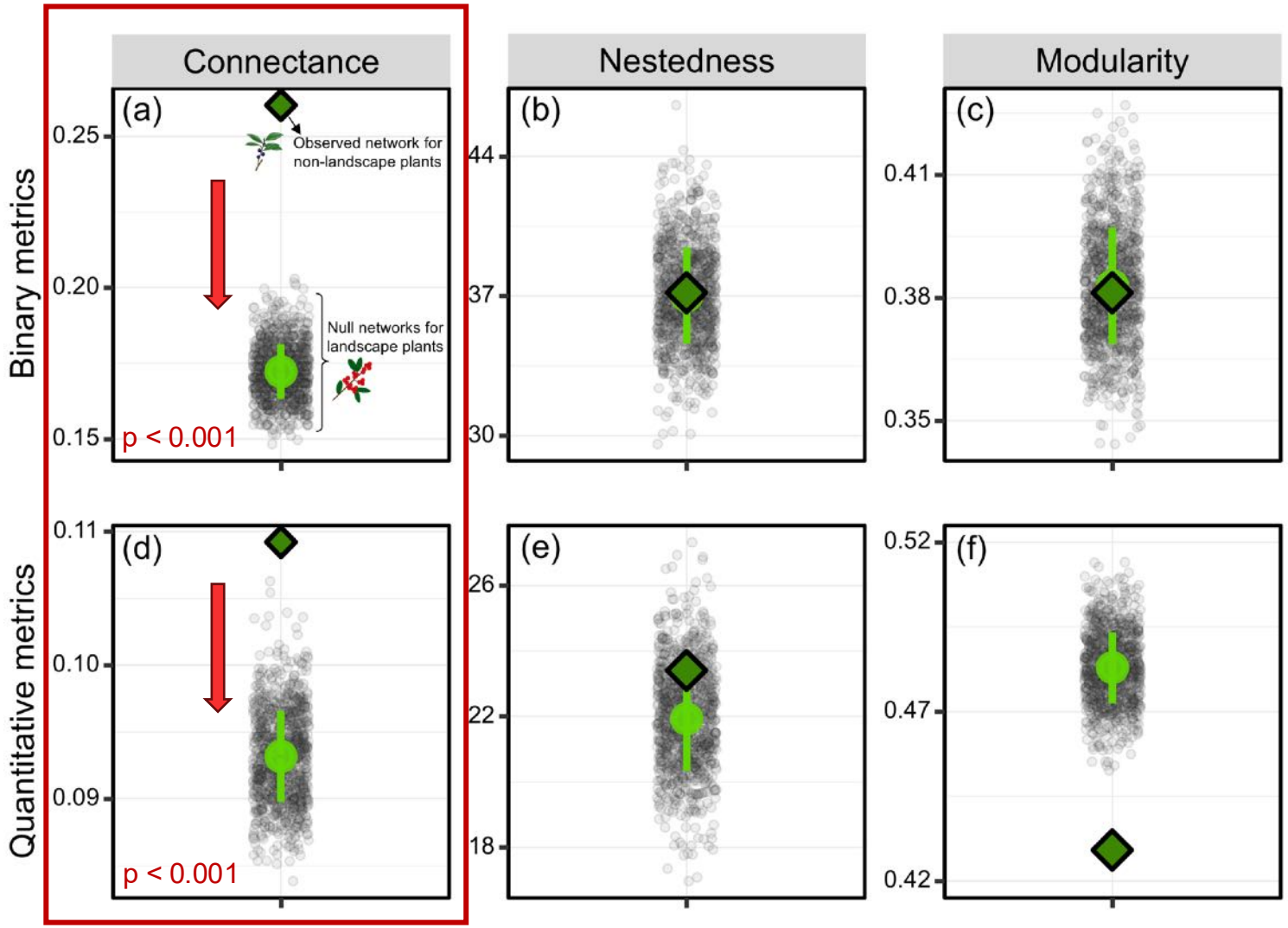
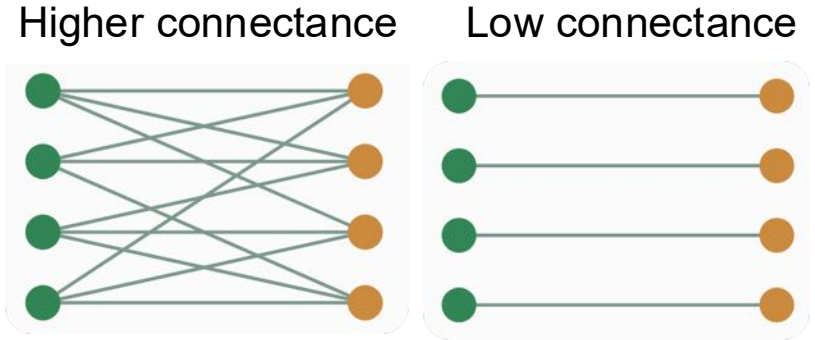
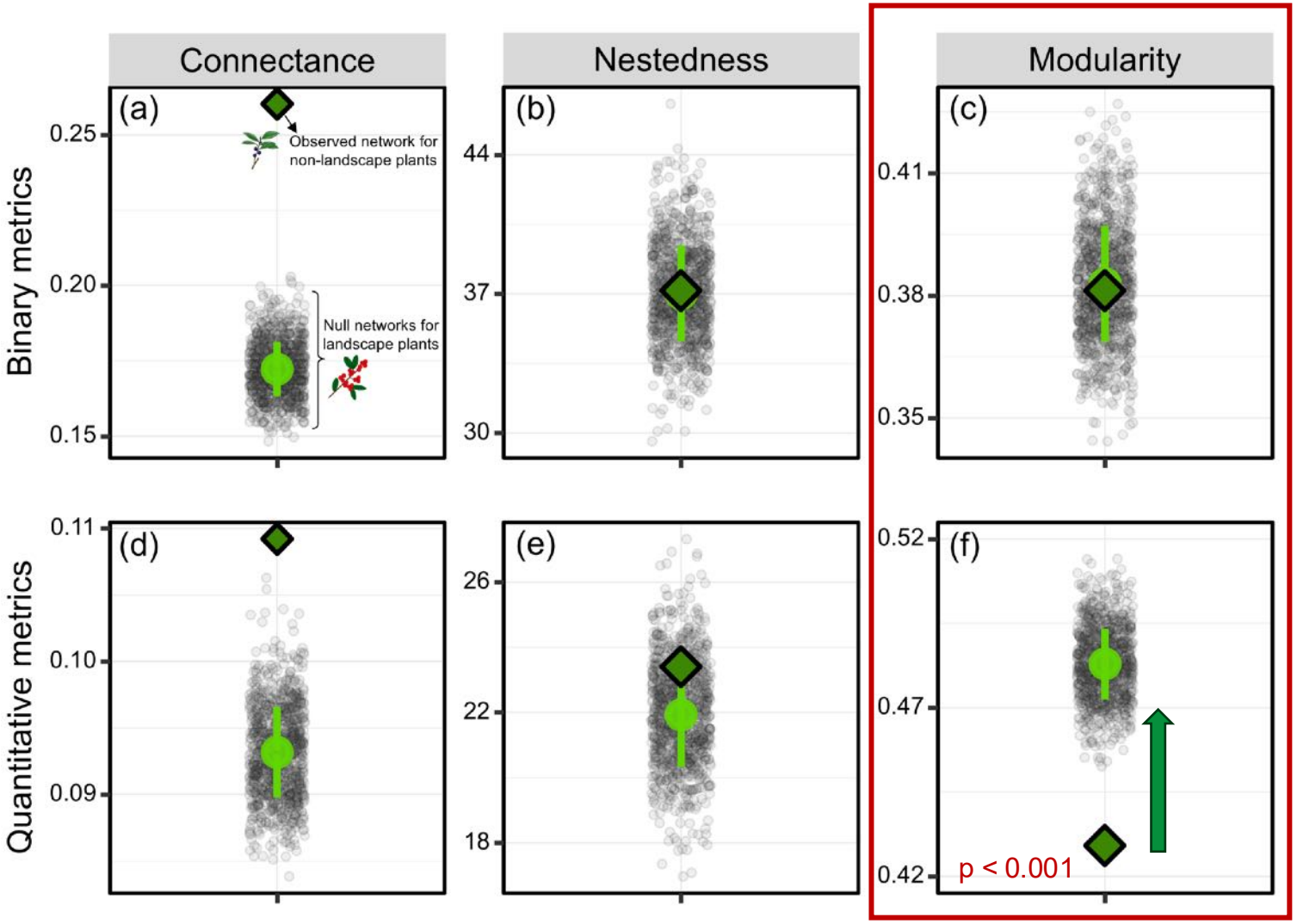


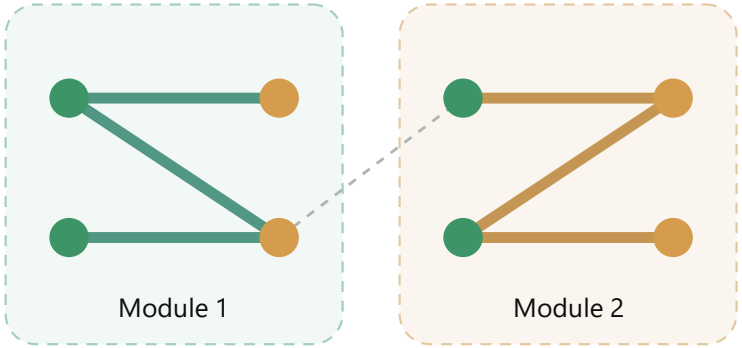


Connectance = Realized links / Possible links

1. Less possible plant-bird links were realized in the landscape network

Result1: Landscape and non-landscape plants support distinct frugivory networks

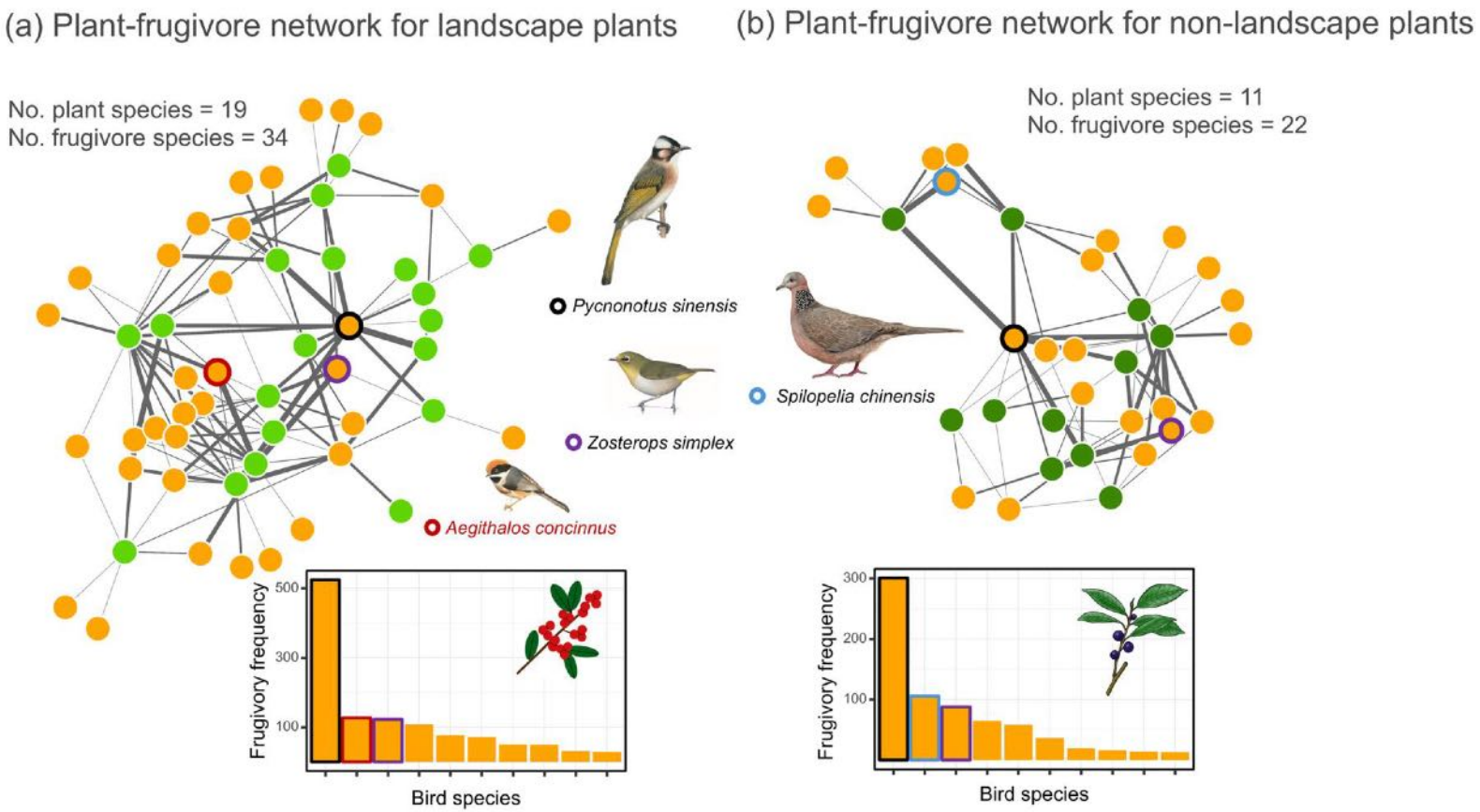




1. Less possible plant-bird links were realized in the landscape network

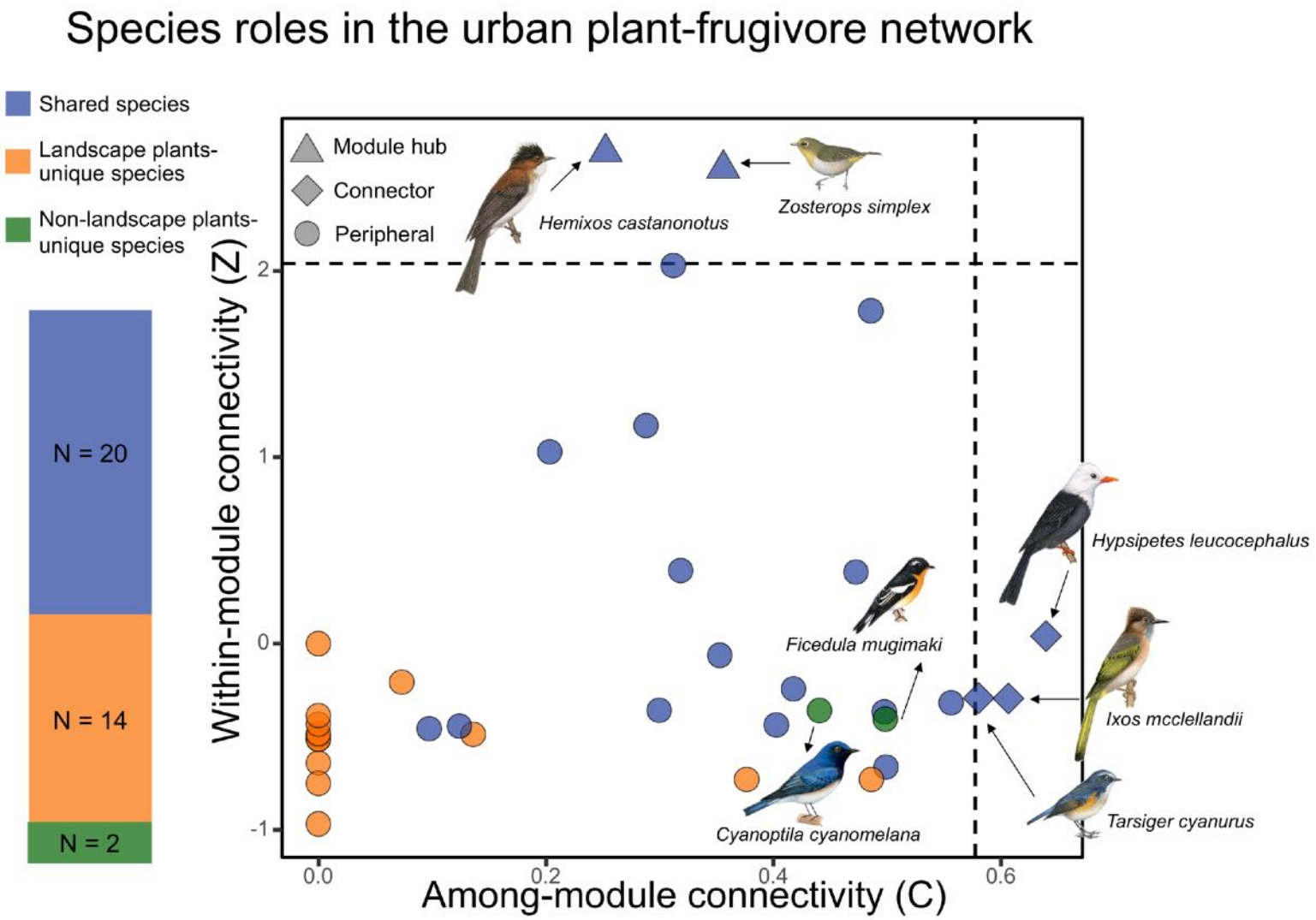
2. Landscape networks was more modular when considering the interaction frequency

Result1: Landscape and non-landscape plants support distinct frugivory networks



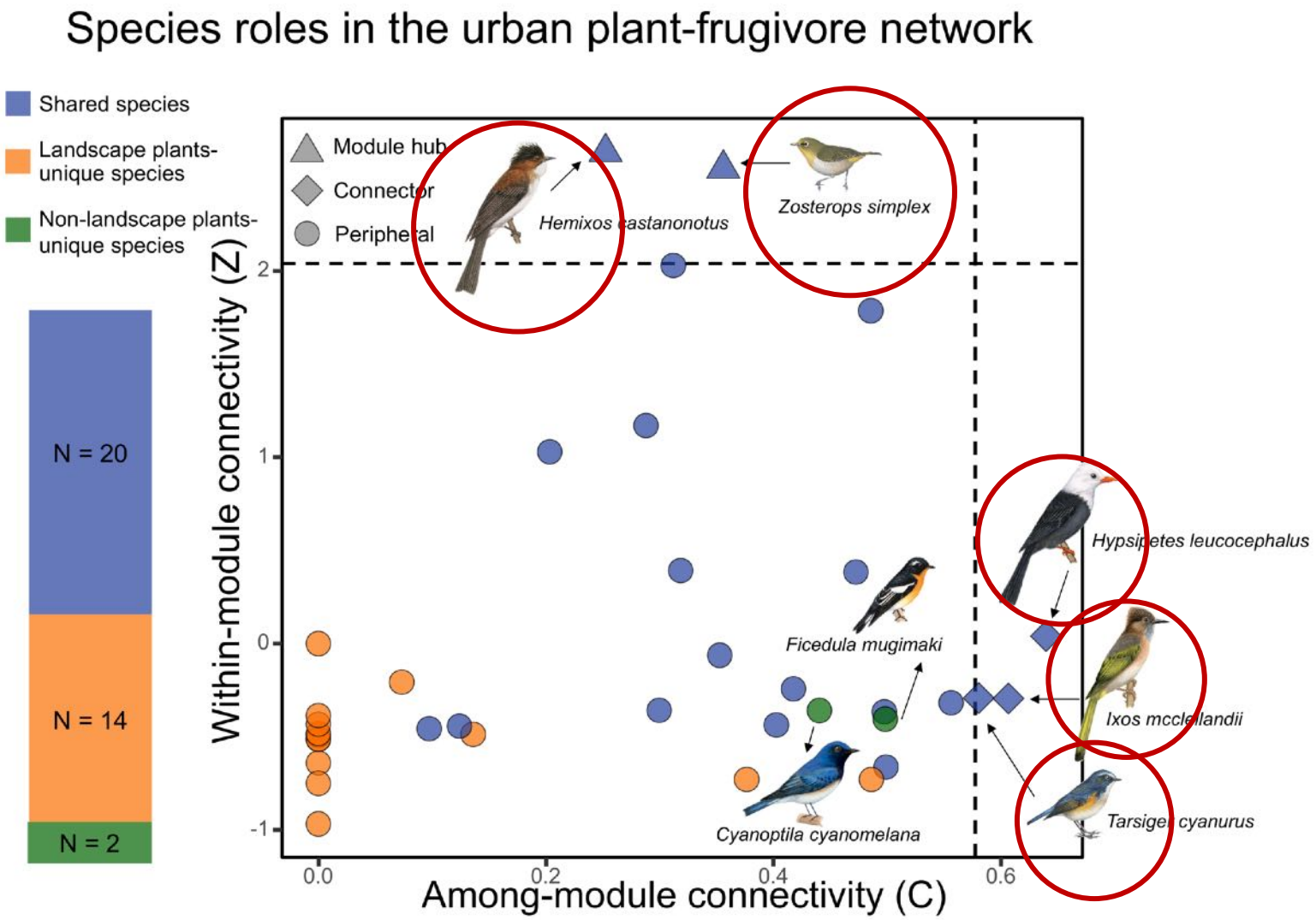
Landscape networks had lower proportion of realized links but stronger within-module interactions.

Result2: Key generalists occupy important positions in combined networks



1. 20 bird species were shared between two types of networks

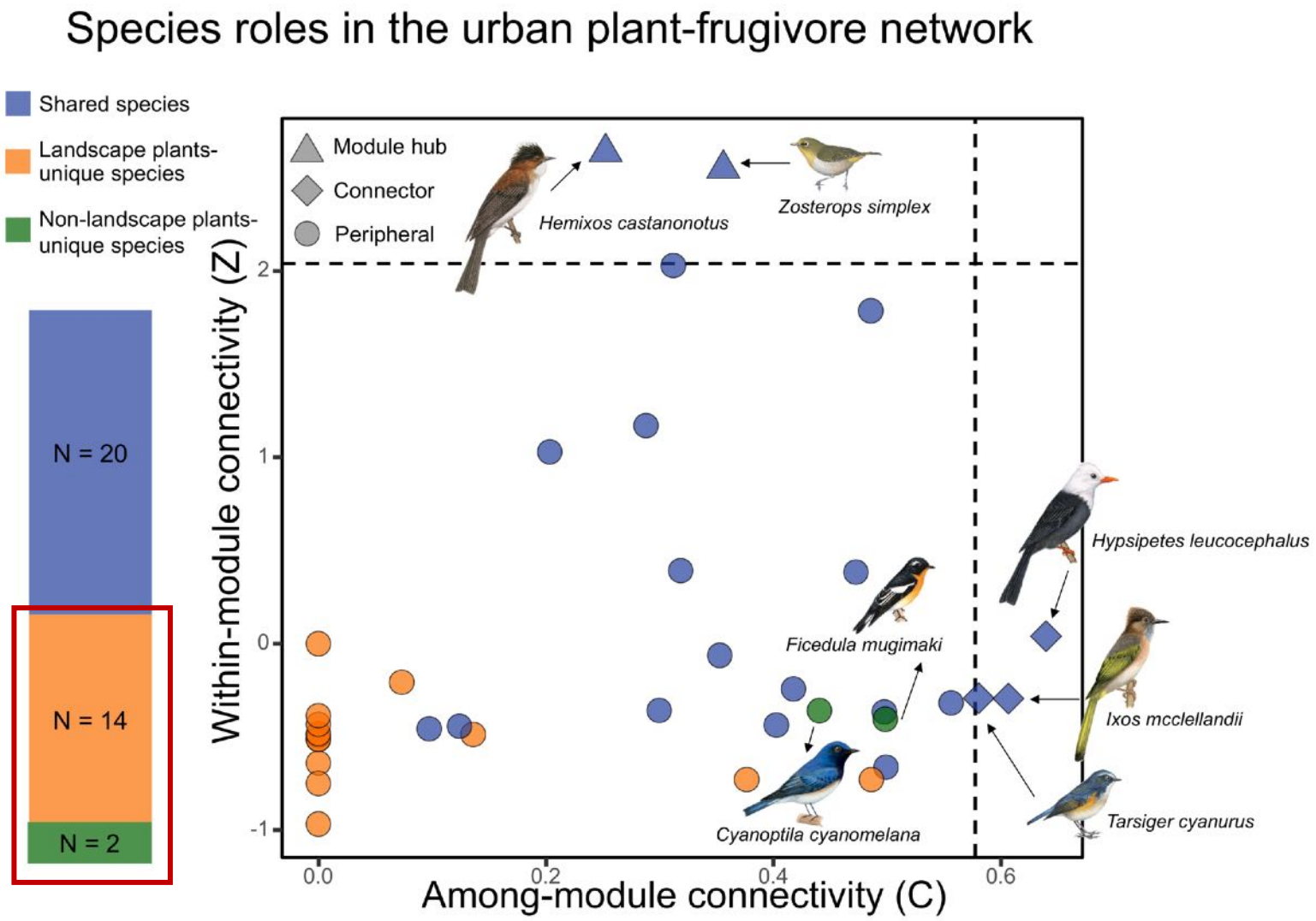
Result2: Key generalists occupy important positions in combined networks



1. 20 bird species were shared between two types of networks

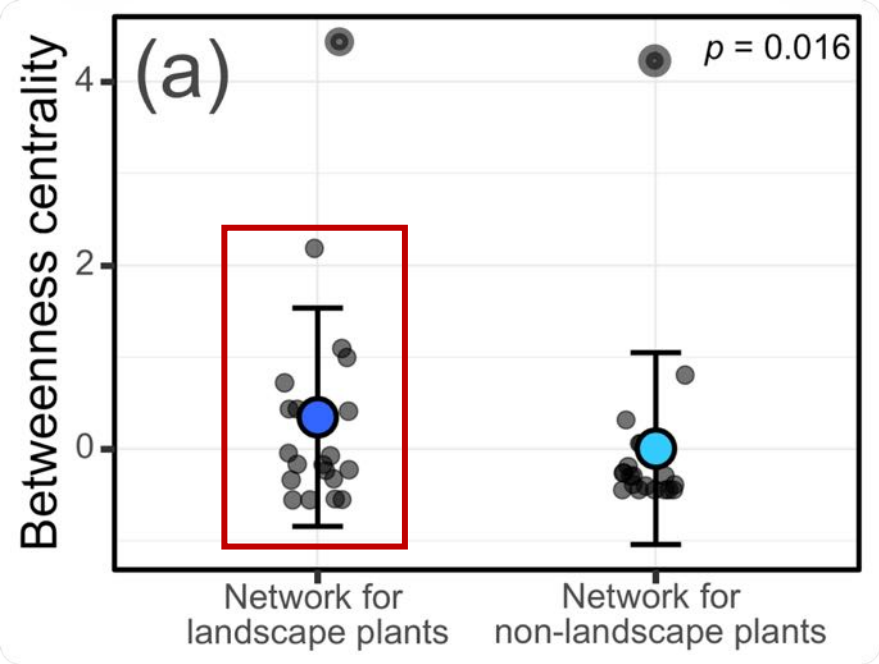
2. Five birds occupy key positions in combined networks

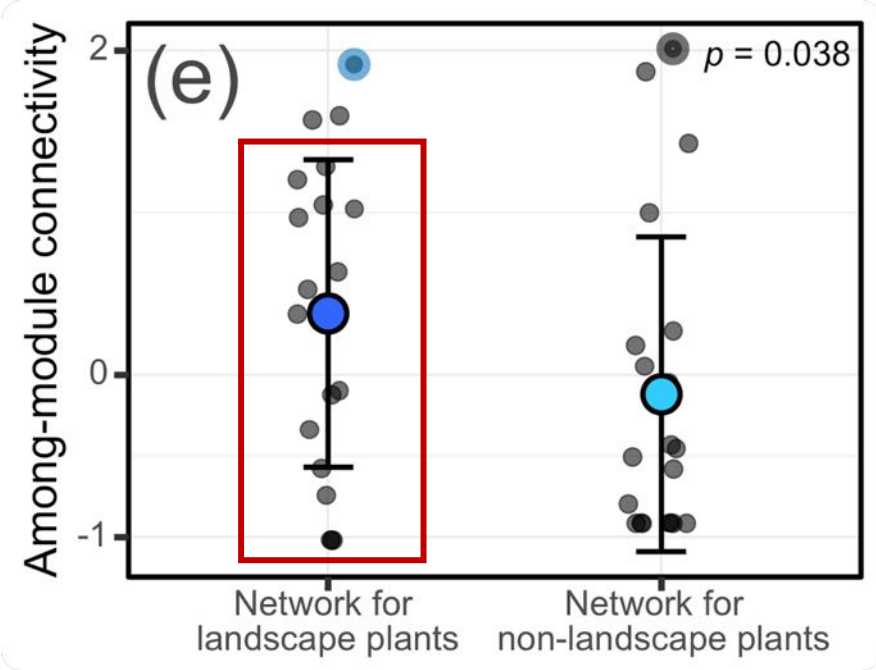
Result2: Key generalists occupy important positions in combined networks

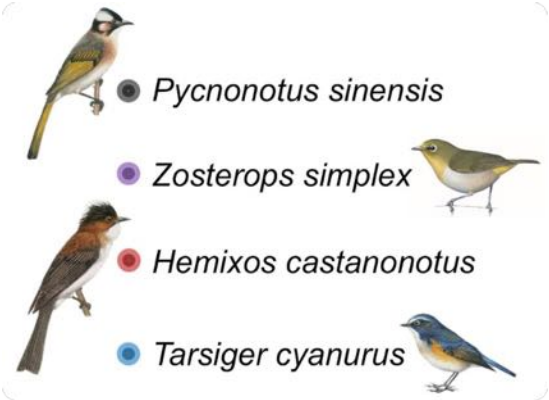


1. 20 bird species were shared between two types of networks
2. Five birds occupy key positions in combined networks
3. Landscape plants exhibit 7-fold higher unique bird species richness

Result3: Shared birds play stronger connecting roles in landscape networks







Shared birds enhanced their role as “ecological bridges” in landscape networks

Summary

1. Networks of lanscape plants had less realized links and these links are more within distinct groups.

2. Birds in networks of landscape plants enhanced role as “ecological bridges” to maintain network structure.

Summary

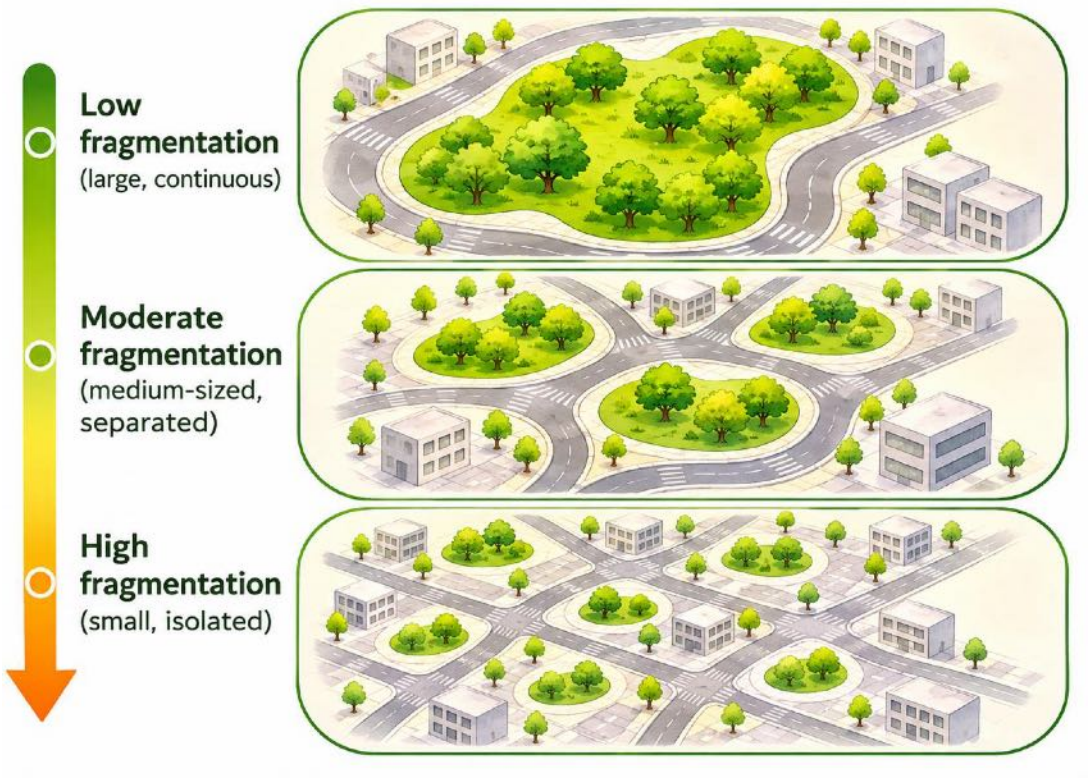
1. Networks of lanscape plants had less realized links and these links are more within distinct groups.

2. Birds in networks of landscape plants enhanced role as “ecological bridges” to maintain network structure.

Bird-friendly cities require suitable plant species that sustain diverse ecological interactions!

What's next?

The trait matching between landscape plants and frugivorous birds along habitat fragmentation in cities





CB-PIN (China Bird-Plant Interaction Network)

Aim: Establishing a bird-flower & bird-fruit interaction database across China

Methods: Field surveys + citizen science across regions and seasons

Conservation: Investigating the impacts of urbanization and environmental change on bird–plant interactions for a bird-friendly habitat design



Please Join us!





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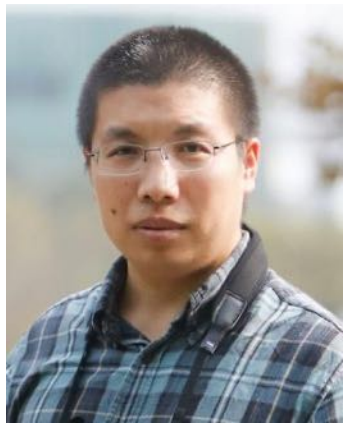
Acknowledgement



Prof. Ping Ding



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Guoqingzi Chen

Gengxian Hao

Dr. Jing Guo

Prof. Wenjie Wang



Thanks for your attention!

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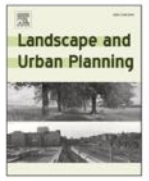

Urban plant communities shape plant–bird frugivory interaction networks through reduced connectance and increased modularity

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