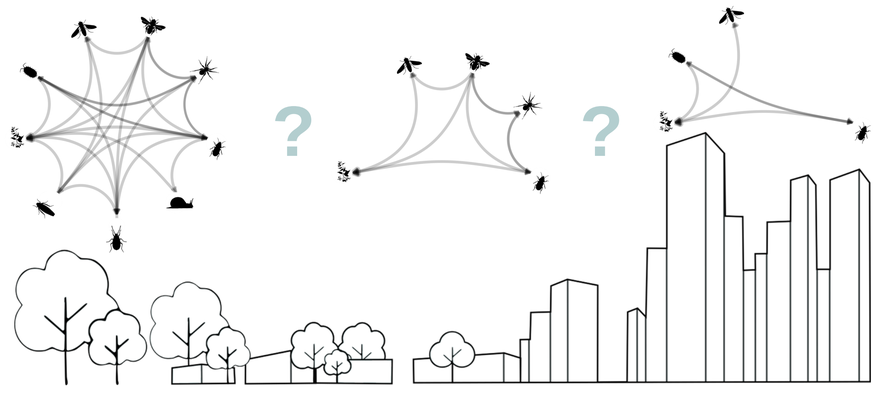
How Urban Densification Shapes the Architecture of Biodiversity in Novel Anthropogenic Communities

Reji Chacko, M., Casanelles Abella, J., Fournier, B., Frey, D., Perrelet, K., and Moretti, M.

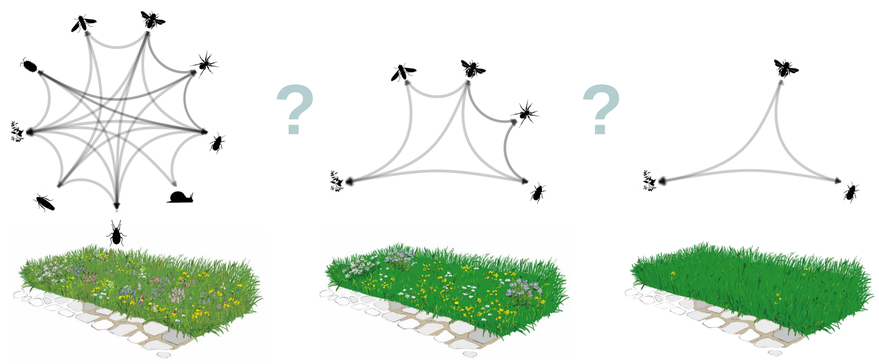
INTRODUCTION

- cities are hotspots of both environmental stress *and* biodiversity[1]
- urban green spaces host novel ecological communities that form complex food webs[2]
- local interventions may be needed to help sustain food web structure and functioning and allow sustainable densification of urban areas

How does urban densification influence food webs in cities?



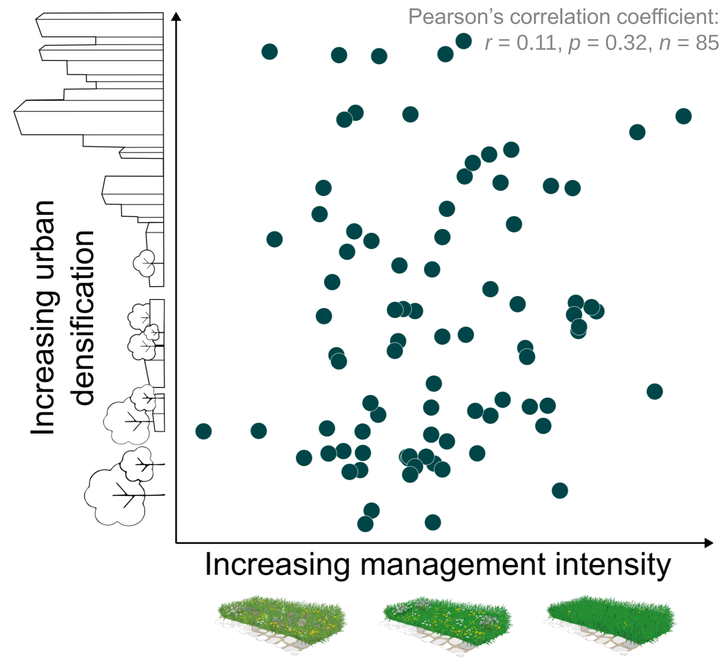
How does management intensity influence food webs in cities?



Does increasing plant diversity mitigate potential negative effects?

STUDY DESIGN

- 85 gardens in Zurich, Switzerland
- two main gradients: urban densification vs. management intensity

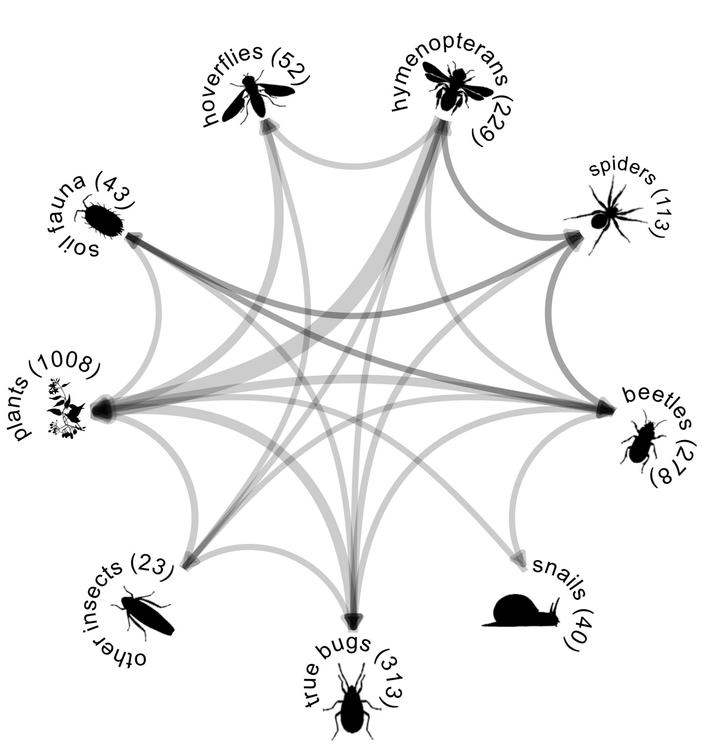


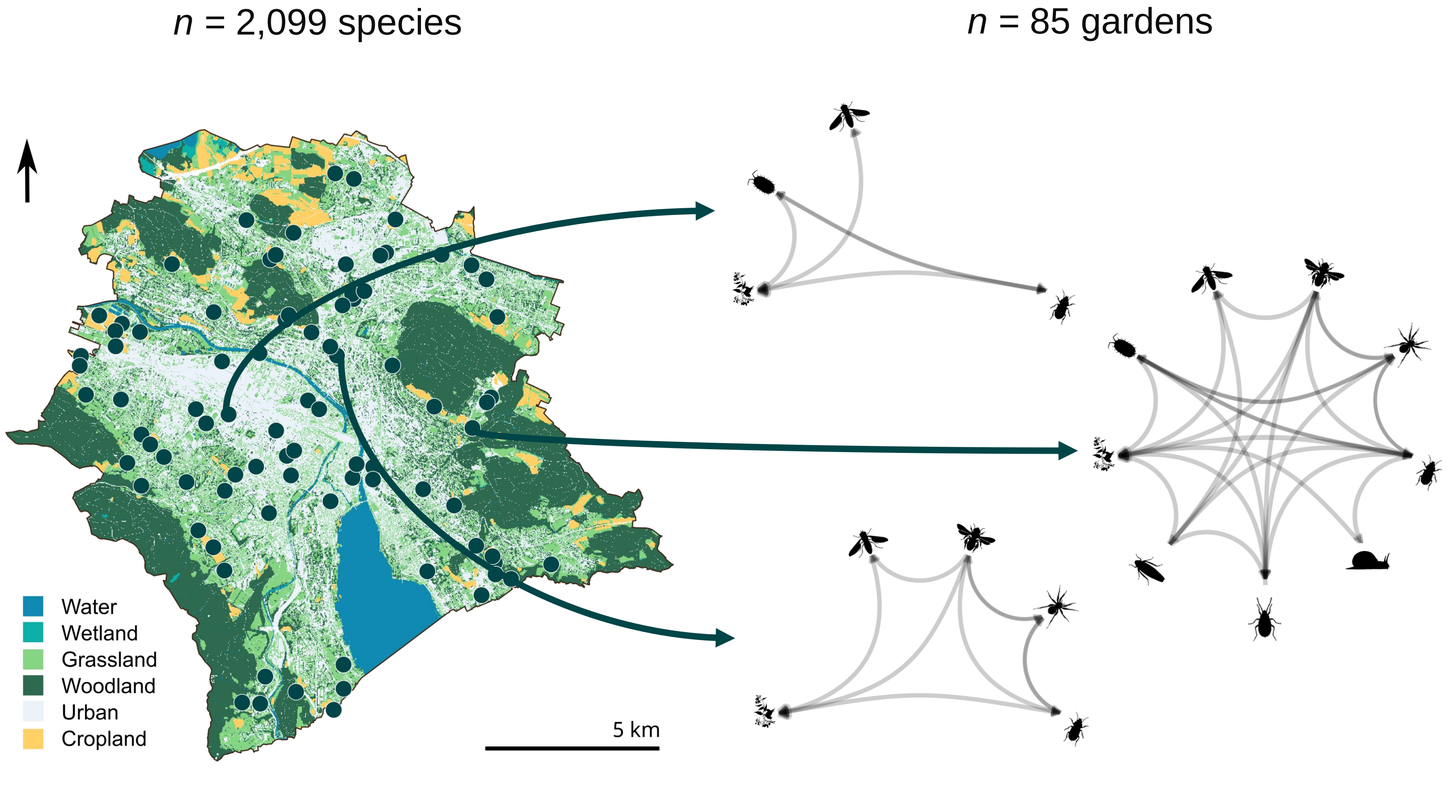
THE METAWEB APPROACH

CITY-LEVEL METAWEB
n = 49,943 interactions from existing literature[3]

GARDEN-LEVEL CO-OCCURRENCES
n = 2,099 species

INFER LOCAL FOOD WEBS
n = 85 gardens



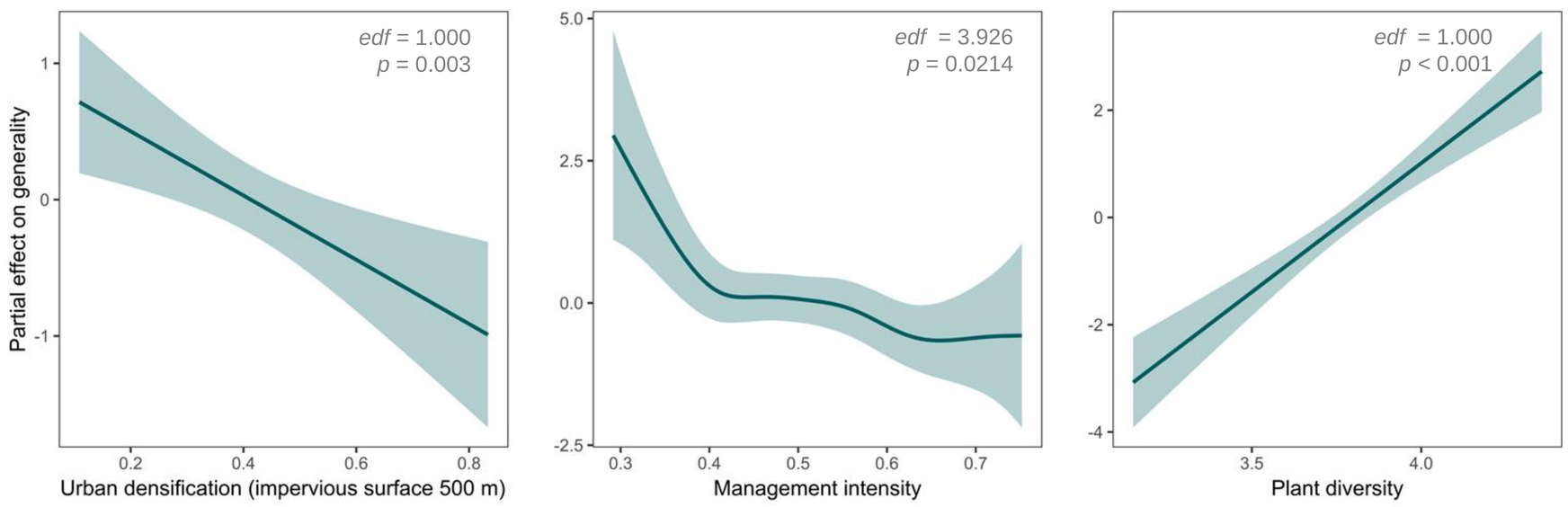


RESULTS

- urban densification and intensive management significantly decreases generality
- improving plant diversity of gardens may mitigate this effect

Smoothed partial effects from GAM (Gaussian, REML) and 95% CI, *R-sq.(adj)* = 0.649, *n* = 81.

GENERALITY: The average number of resource species available per consumer in the food web.



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2. Theodorou, P. (2022). The effects of urbanisation on ecological interactions. *Current Opinion in Insect Science*, *52*, 100922. https://doi.org/10.1016/j.cois.2022.100922
3. Reji Chacko, M., Albouy, C., Altermatt, F., Abella, J. C., Brändle, M., Boussange, V., Campell, F., Ellis, W. N., Fopp, F., Gossner, M., Ho, H.-C., Joss, A., Kipf, P., Neff, F., Petrović, A., Prié, V., Tomanović, Ž., Zimmerli, N., & Pellissier, L. (2024). trophiCH - a national species-level trophic metaweb of 23k species for Switzerland. *EcoEvoRXiv*. https://ecoevorxiv.org/repository/view/7294/

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