

# Spatiotemporal Biodiversity Patterns in Urban and Peri-Urban Forests Using eDNA Metabarcoding

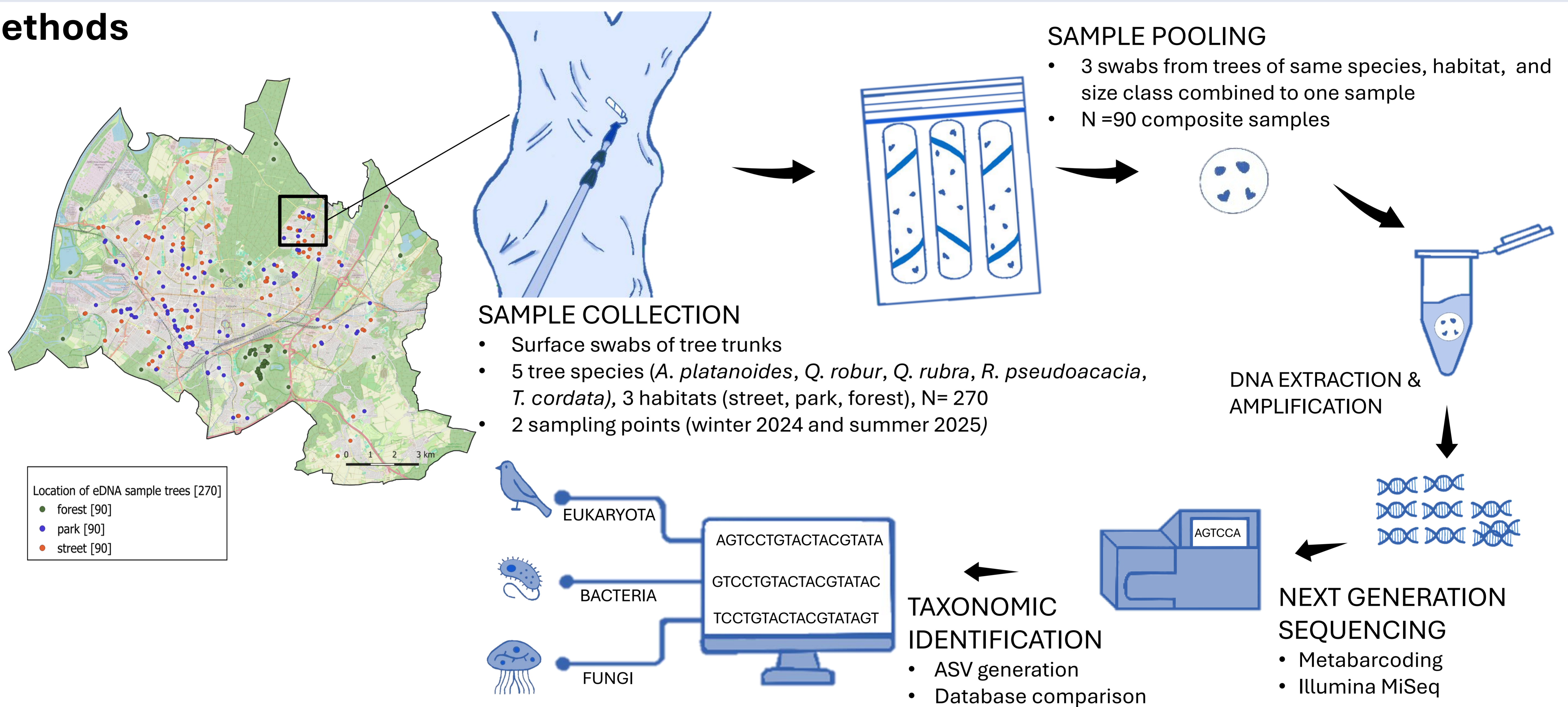
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## Urban trees support multi-kingdom biodiversity

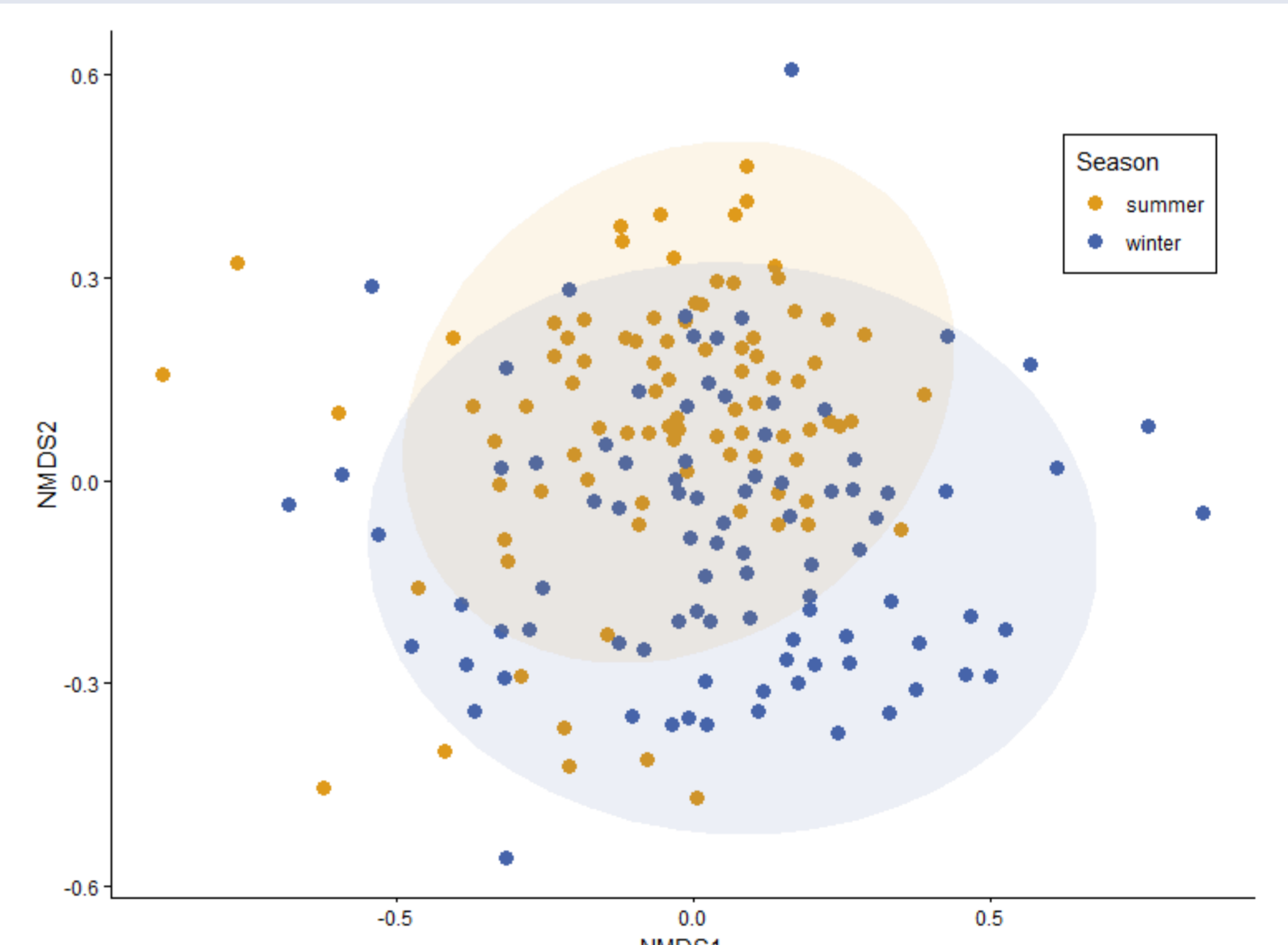
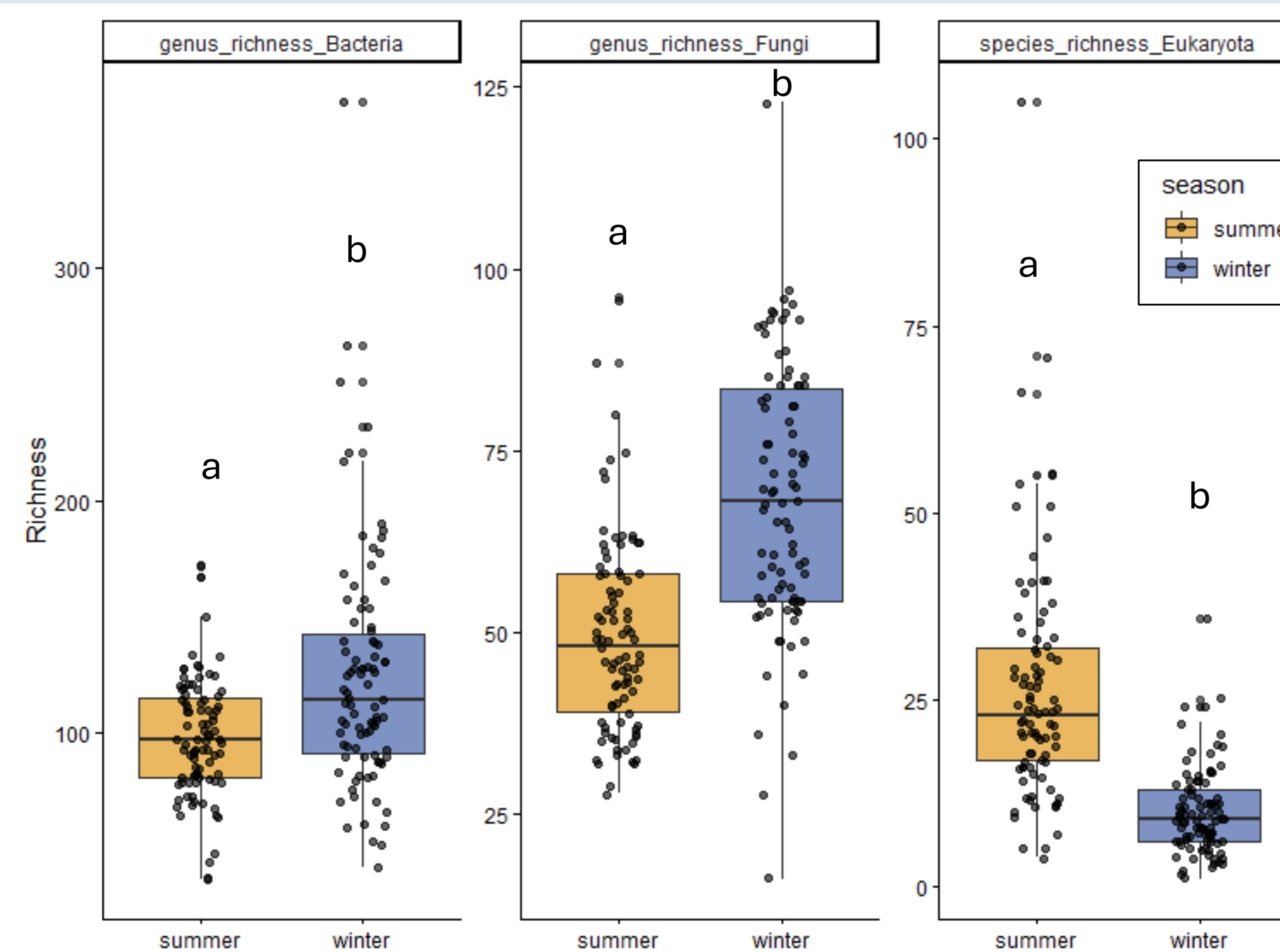
Urban trees support diverse communities of eukaryotes, fungi, and bacteria that contribute to key ecosystem functions such as nutrient cycling, plant health, and ecosystem stability. Most urban biodiversity studies focus on single taxonomic groups, leaving multi-kingdom patterns poorly understood. Working hypothesis: Seasonal changes drive contrasting patterns of richness and community composition across taxonomic groups on urban trees.

## Methods



## Results

- Seasonal patterns in taxonomic richness differed among kingdoms. Eukaryote species richness peaked in summer, whereas bacterial and fungal genus richness was significantly higher in winter.
- Bacterial community composition differed significantly between seasons (PERMANOVA, Bray-Curtis dissimilarity,  $p = 0.001$ ), while site, tree species, and DBH had no significant effect.



## Conclusion and outlook

Taxonomic richness showed contrasting seasonal patterns, with higher eukaryotic diversity in summer and higher bacterial and fungal genus diversity in winter. The composition of bacterial communities varied noticeably between seasons, suggesting a strong seasonal turnover in microbial communities associated with urban trees. These results suggest that seasonal environmental conditions influence different components of tree-associated biodiversity in different ways. Subsequent analyses aim to identify additional factors that influence the taxonomic richness and species composition.



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