Ecosystem Size Tunes the Effects of the Spatial Feedback Between Autotrophic and Heterotrophic Ecosystems on Ecosystem Function

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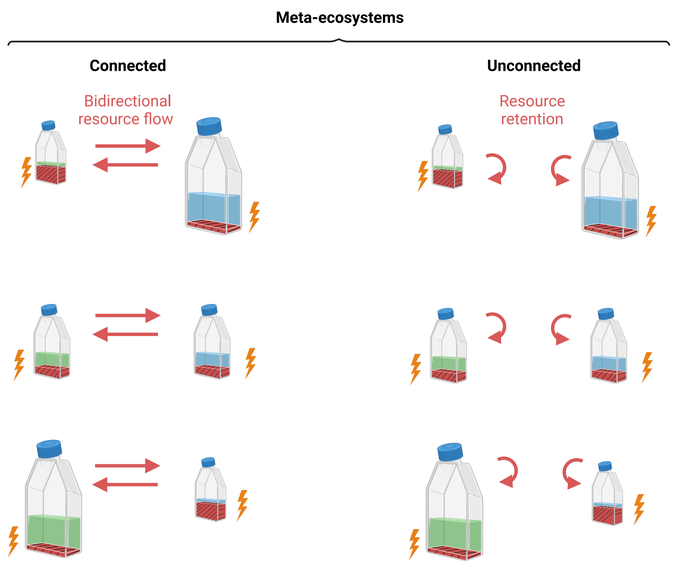
BACKGROUND

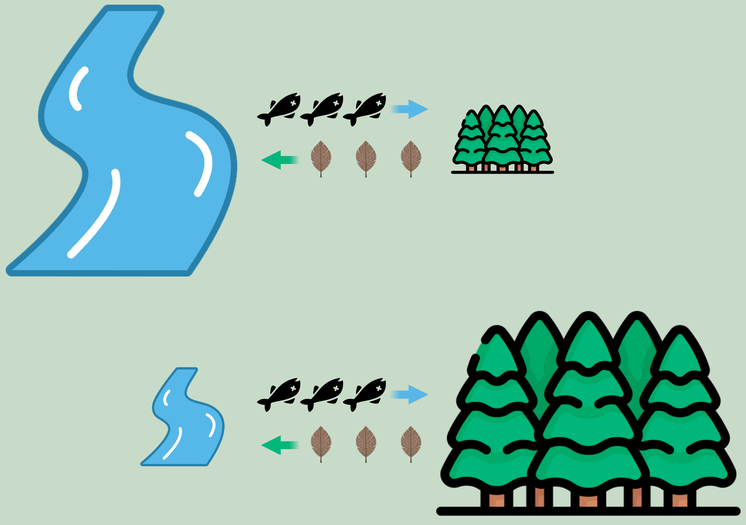
- Patch size is a key factor driving biodiversity
- Focus has been so far on dispersal
- But resource flow also impacts biodiversity
- We don't know if patch size can impact biodiversity through resource flow

METHODS

- Compared biodiversity of meta-ecosystems with symmetric vs asymmetric patch sizes
- Meta-ecosystem: two protist mixed cultures connected through resource flow
- All patches started with the same 11 protist species
- Resources generated through disturbance
- The smaller the patch the more disturbed



Ecosystem size tunes the effect of non-living subsidies on ecosystem function



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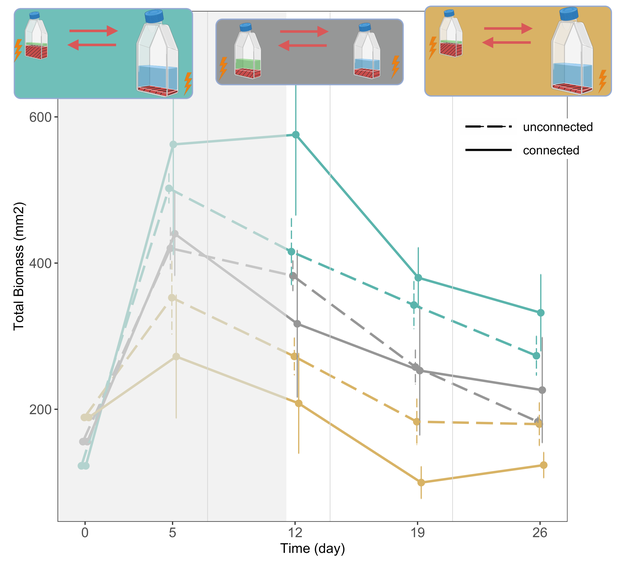
RESULTS

- Small-Large meta-ecosystems had **lower mean α diversity but higher β diversity**
- The effects of patch size on biodiversity came from two opposing forces:
  - **asymmetry in patch size per se** increased β diversity and decreased mean α diversity
  - **resource flow** decreased β diversity and increased mean α diversity
- The effects of asymmetry in patch size per se were stronger



CONCLUSION

- Patch size can impact biodiversity through resource flow
- Understanding the effects of patch size on biodiversity needs to consider
  - its effects on resource flow
  - ecosystems of different types, as they are connected by resource flow

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