

Biodiversity effects on litter decomposition

Veronique Vos
Biocycle Project



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Biodiversity research

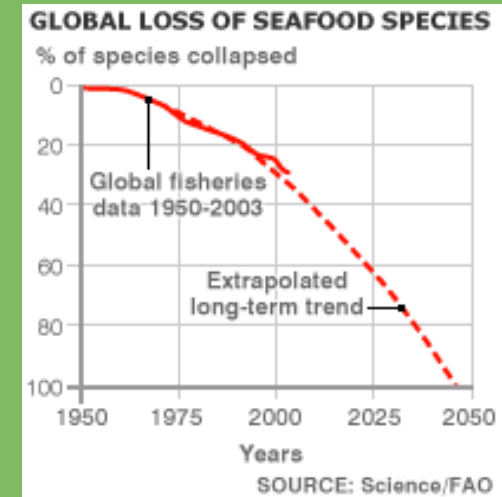
Biodiversity loss

6th mass extinction

Ca. 30.000 species per year

100 times faster than background

How does this affect ecosystem functioning ?



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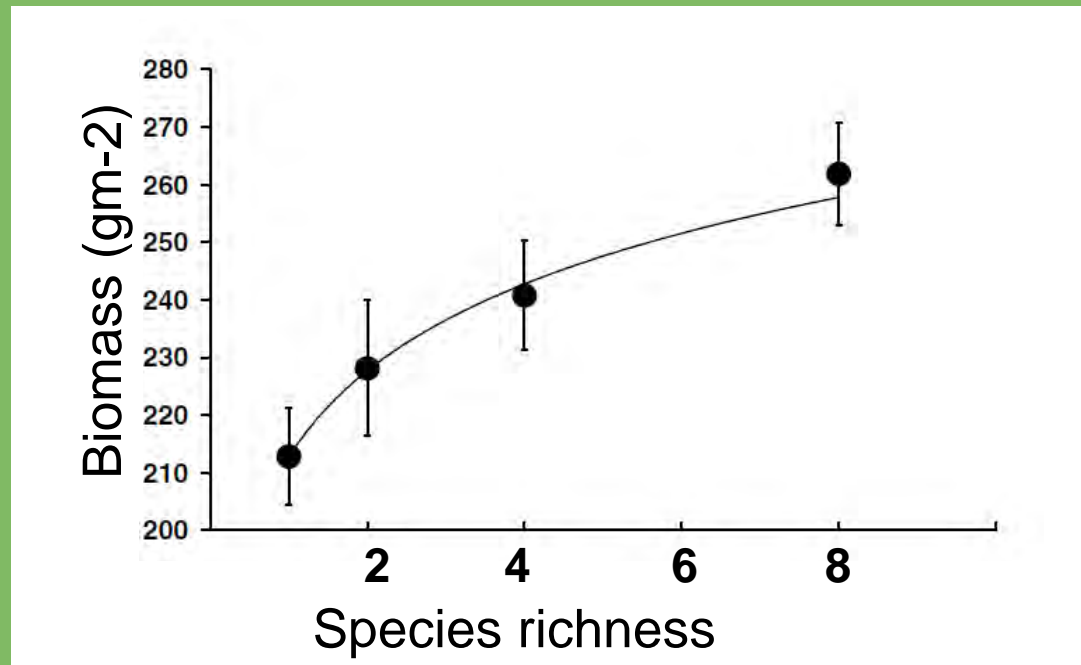
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Biodiversity research

Plant productivity diversity relationship



Ruijven and Berendse, 2003



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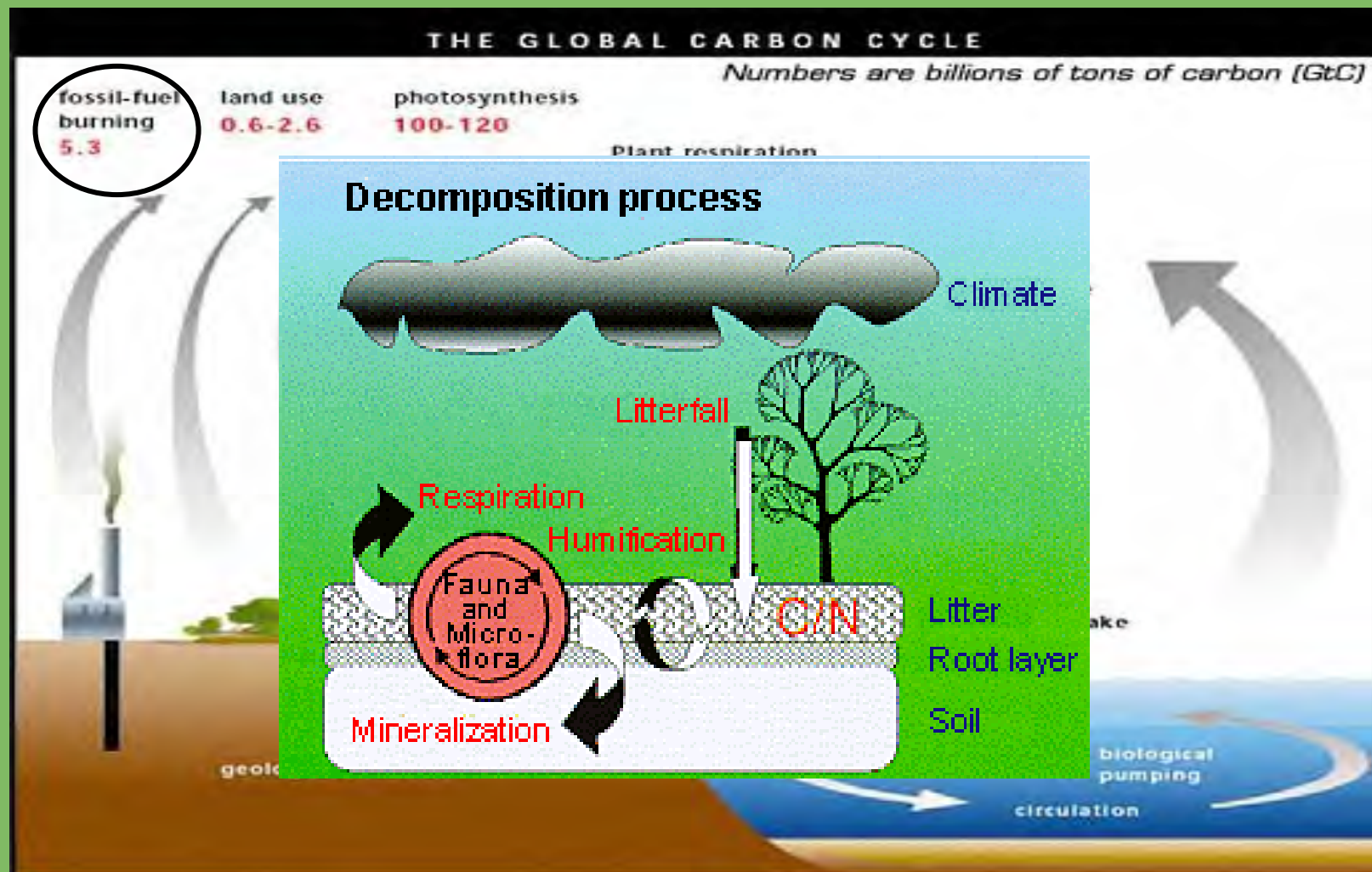
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Why decomposition?



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Biodiversity research

Decomposition:
No clear relationship
with
biodiversity



Hättenschwiler et al 2005



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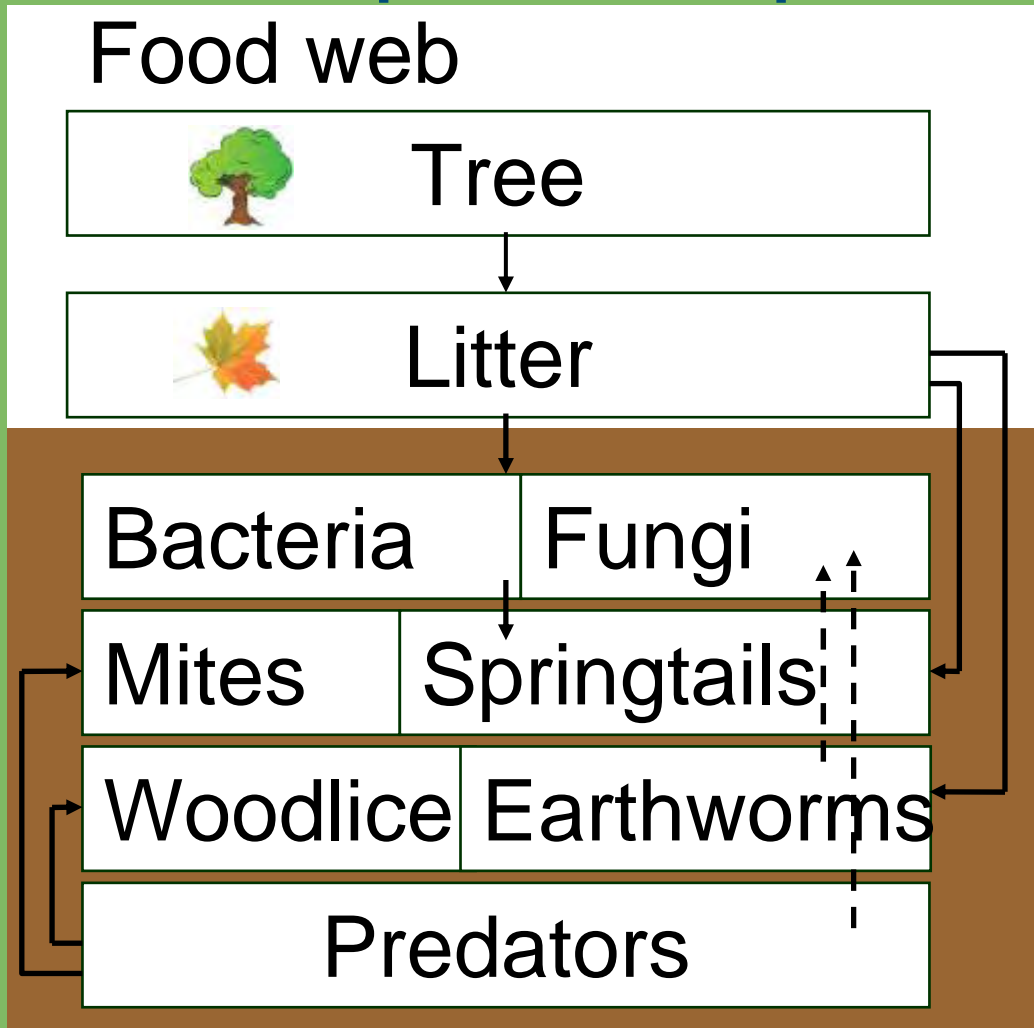
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Decomposition process



Many interactions

Multitrophic



Biocycle main project:



Research questions:

1. Effect litter diversity on decomposition?
2. Effect fauna diversity on decomposition?
3. Similar patterns across biomes?



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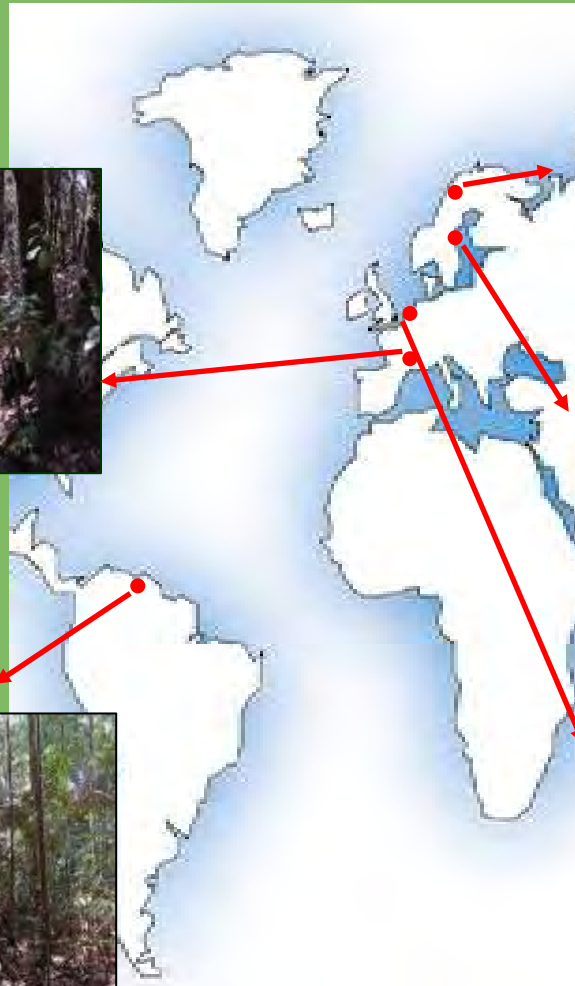
Methods



2 systems

Aquatic

Terrestrial



5 climate zones



Sub-arctic



Boreal
Temperate



Mediterranean
Tropical



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Methods

Litter diversity (functional groups)

- nitrogen fixer
- fast decomposer
- evergreen
- slow decomposer



Fauna diversity

- no fauna
- meso fauna (springtails/mites)
- all fauna



Personal project

Research question:

What is the effect of macro-detritivores ?

Often ignored but:

Mesh effect Biocycle



Methods

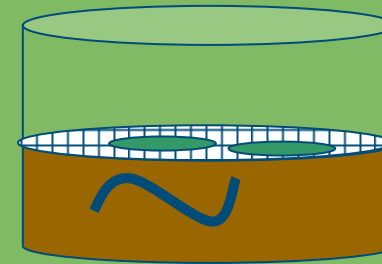
4 litter species (monoculture and mixtures)

Beech *Fagus sylvatica*

Alder *Alnus glutinosa*

Holly *Ilex aquifolium*

Grey Willow *Salix cinerea*



4 fauna treatments (monoculture only)

Woodlice *Porcellio scaber*,

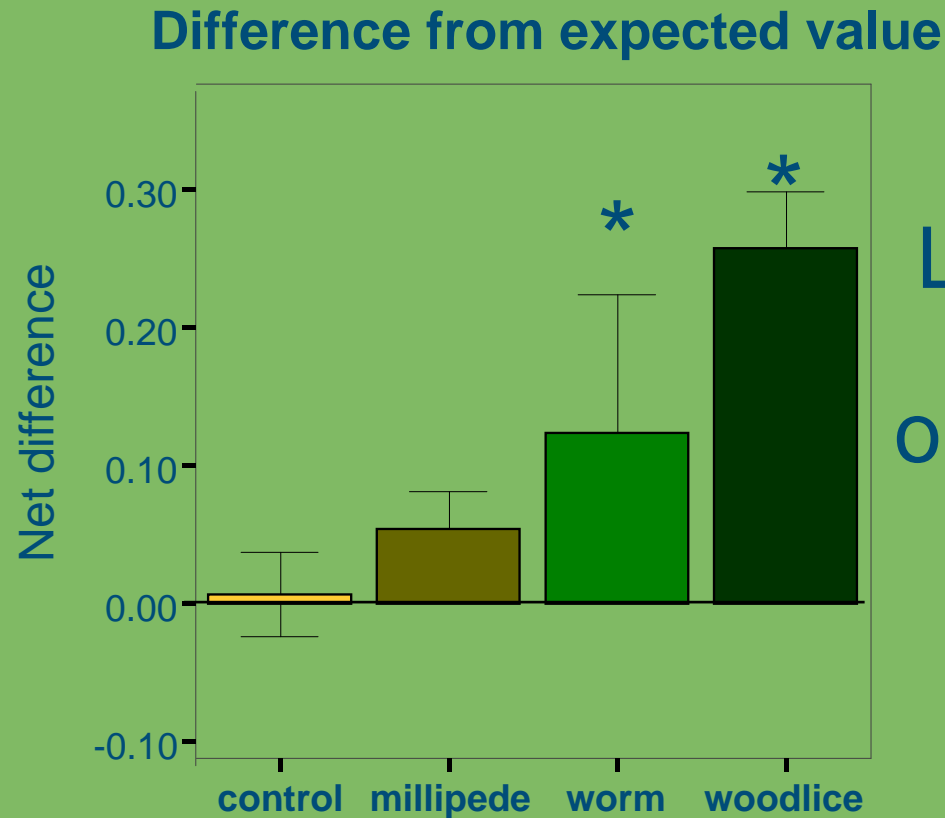
Millipede *Cylindroiulus caeruleocinctus*

Earthworm *Lumbricus rubellus*

control without fauna



Results: litter mixture effects



Litter mixture effect:
observed > expected



Mechanisms?

1 Selection: dominant species effect

- Food preference

2 Complementarity: positive interactions

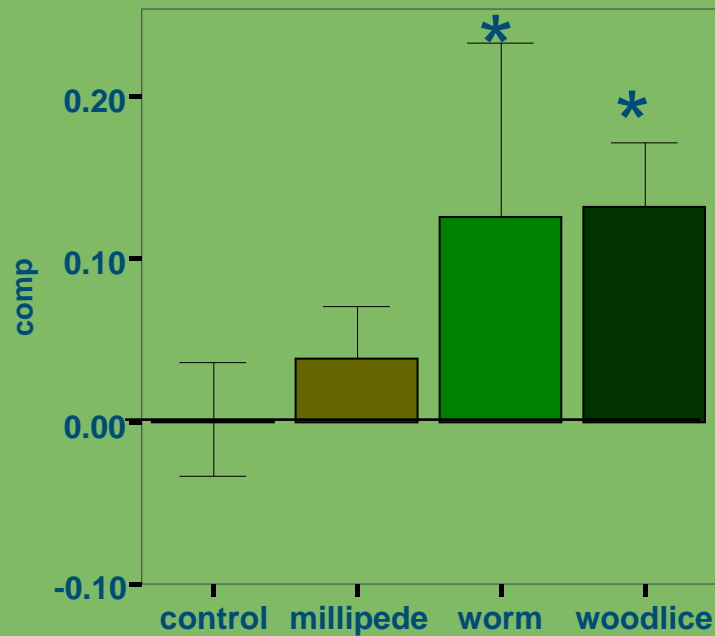
- Mixed diet
- Litter mixing
- Litter fragmentation

with additive partitioning method (Loreau and Hector 2001)

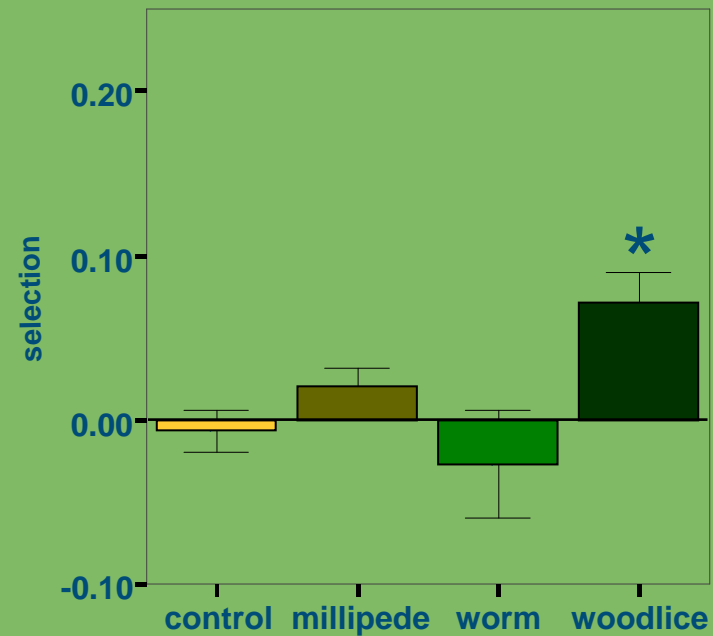


Results: mechanisms

Complementarity effect



Selection effect



New experiment

Litter and animal diversity

6 litter species

3 detritivores species



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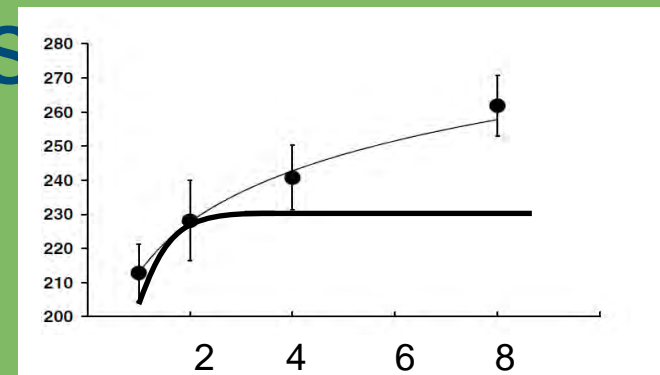
Take home message

There are diversity effects

Fauna important

Mechanisms: complementarity

Species identity matters



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