A SHORT JOURNEY INTO SOIL DETRITIVORES FECES

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EGU General Assembly 2022

OM TRANSFORMATION

Litter transformers feeding activity strongly alters organic matter properties

Joly et al., 2020, *Communications Biology*

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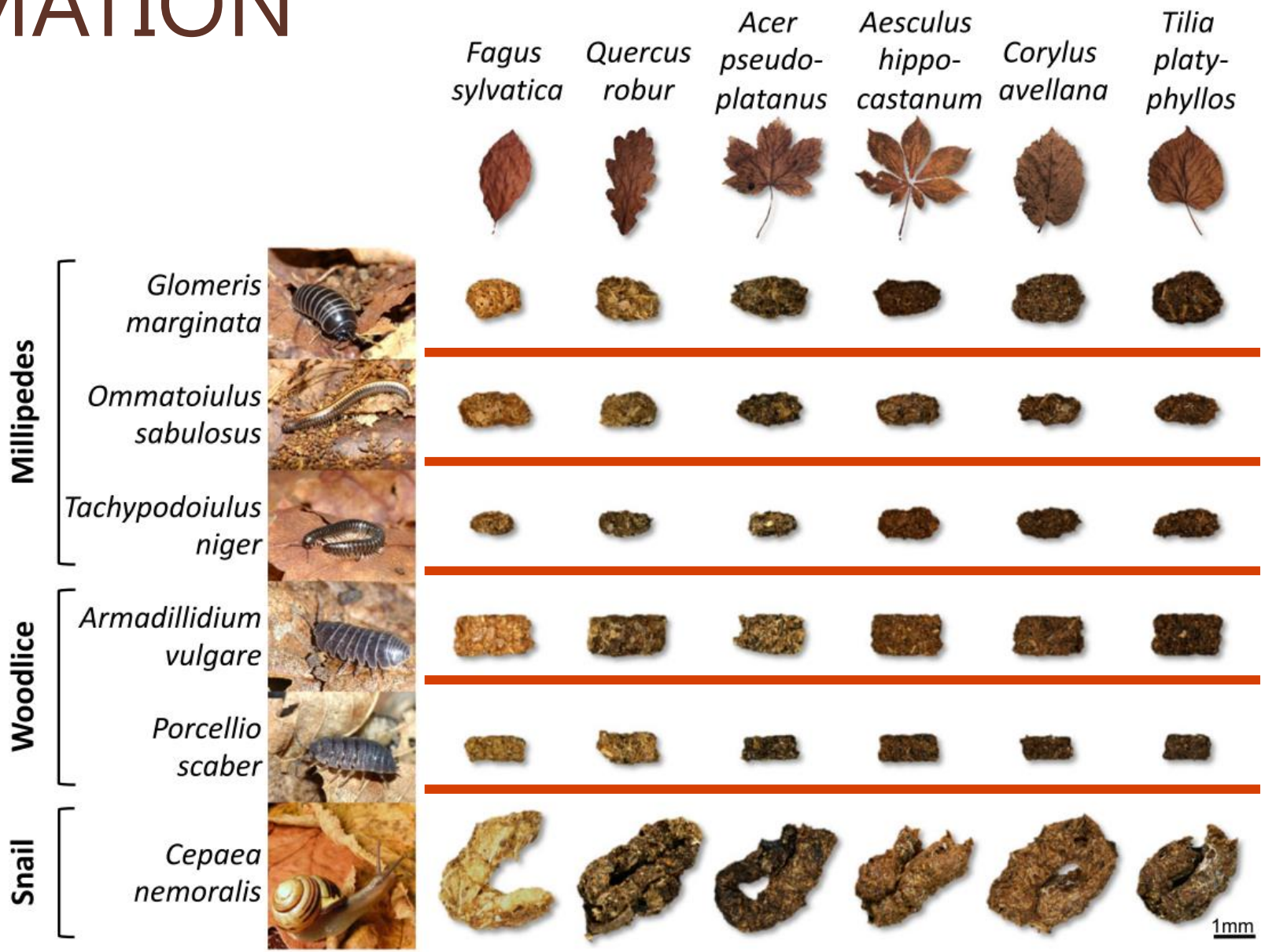
Feces properties:
- Animal identity effect



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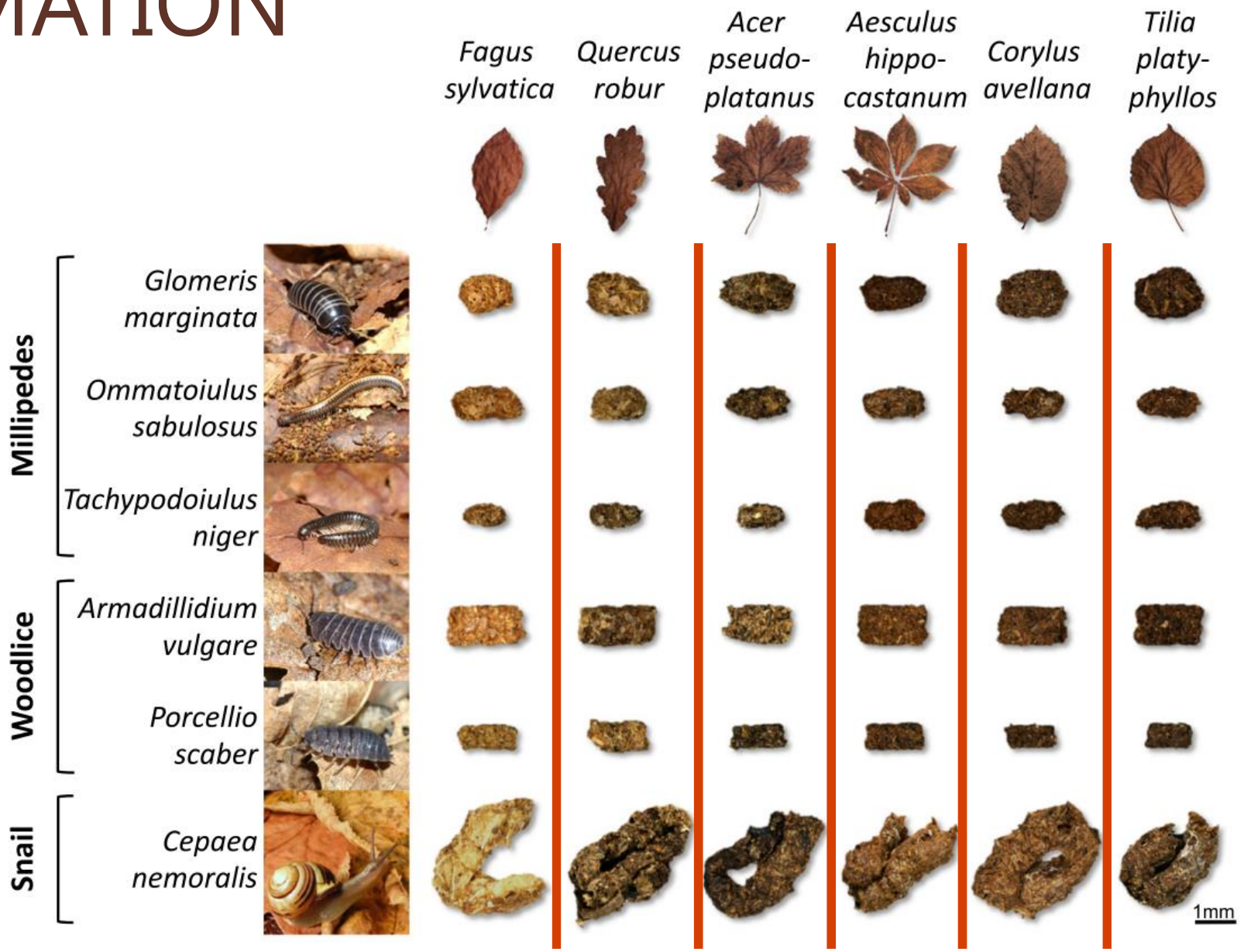

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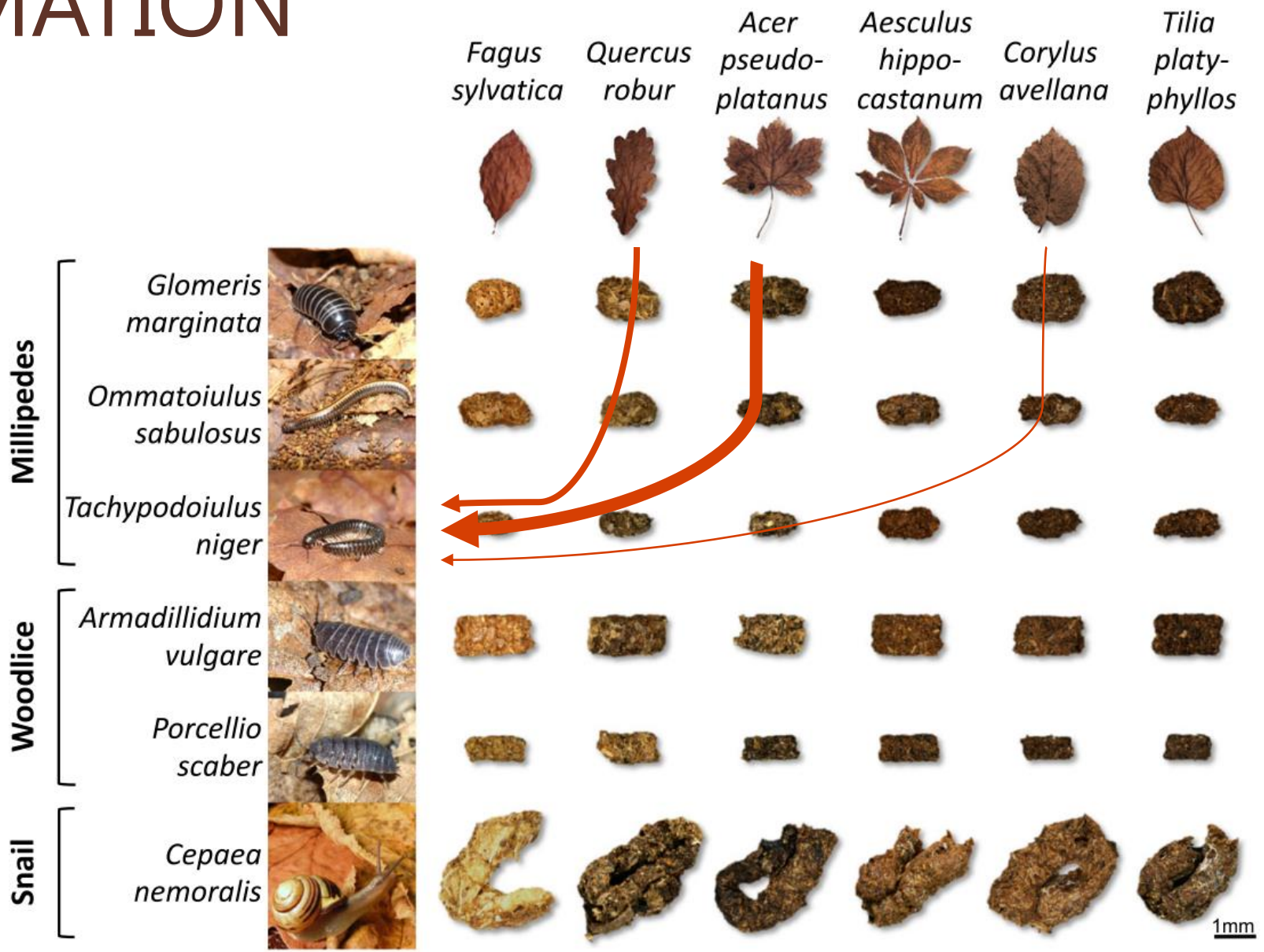
Detritivores exhibit feeding preferences

How feeding preferences affects feces properties?



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HYPOTHESES

1. Feces properties are predictable from diet composition
   Plant identity effect

2. Woodlice and millipede produce feces with different properties
   Animal / phylogenetic group identity effect

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Leaf litter morphological traits, invertebrate body mass and phylogenetic affiliation explain the feeding and feces properties of saprophagous macroarthropods

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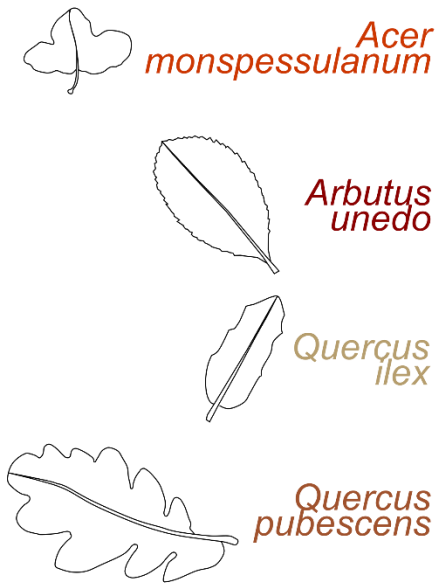
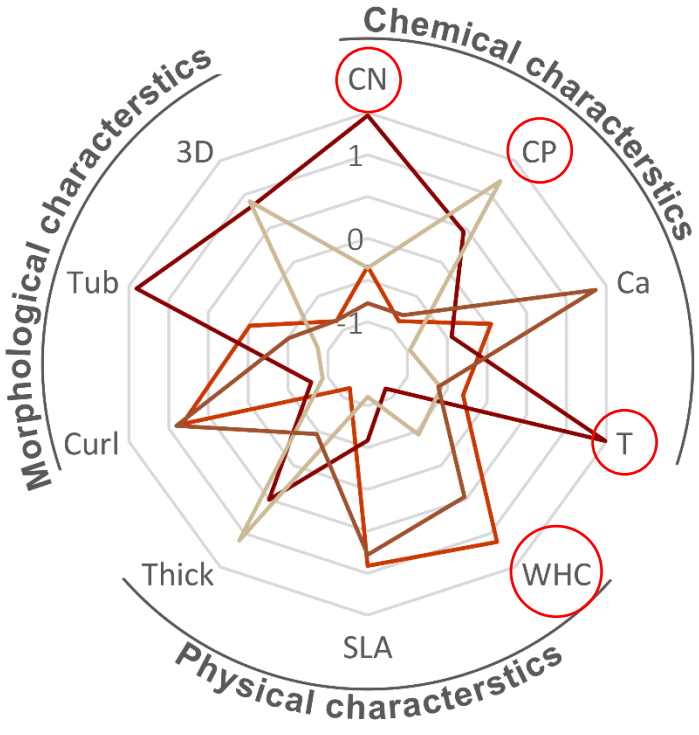
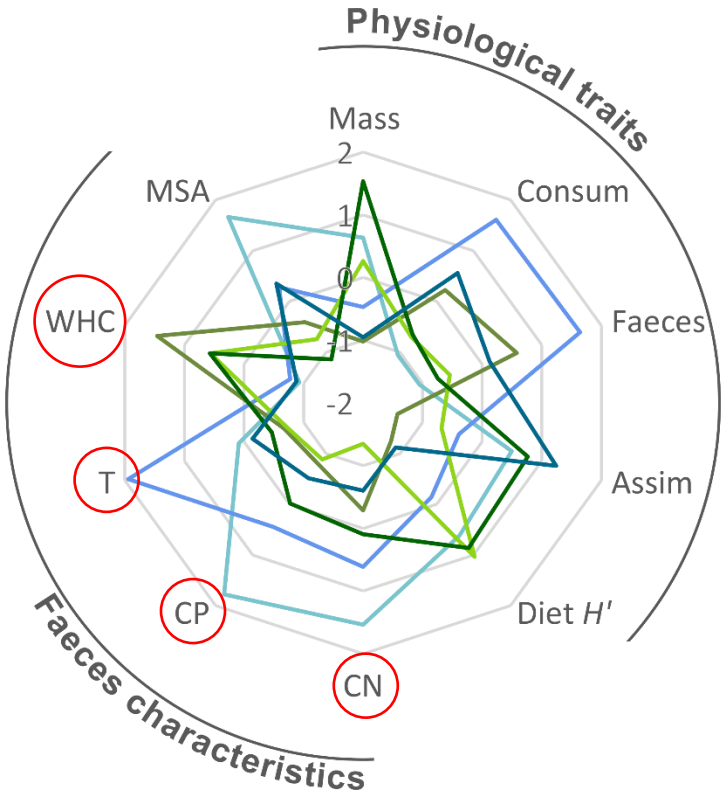
EXPERIMENTAL DESIGN

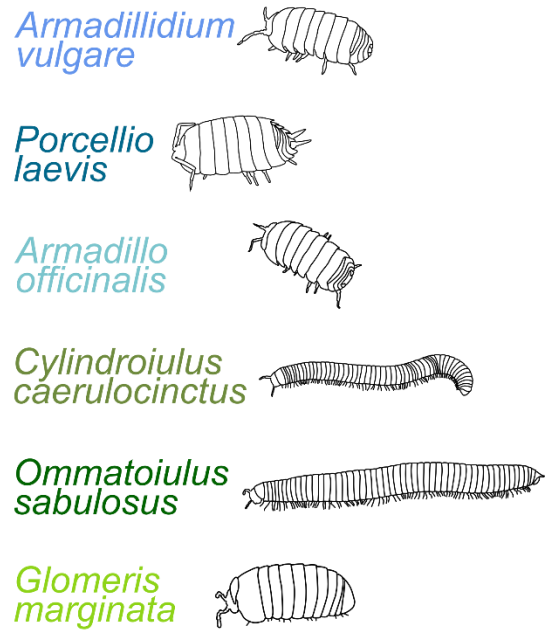
Microcosms, 2 weeks, 4 x 1g litter/10 individuals, 5 rep/species

4 litter, 6 detritivore species, common & co-occuring in Mediterranean ecosystems





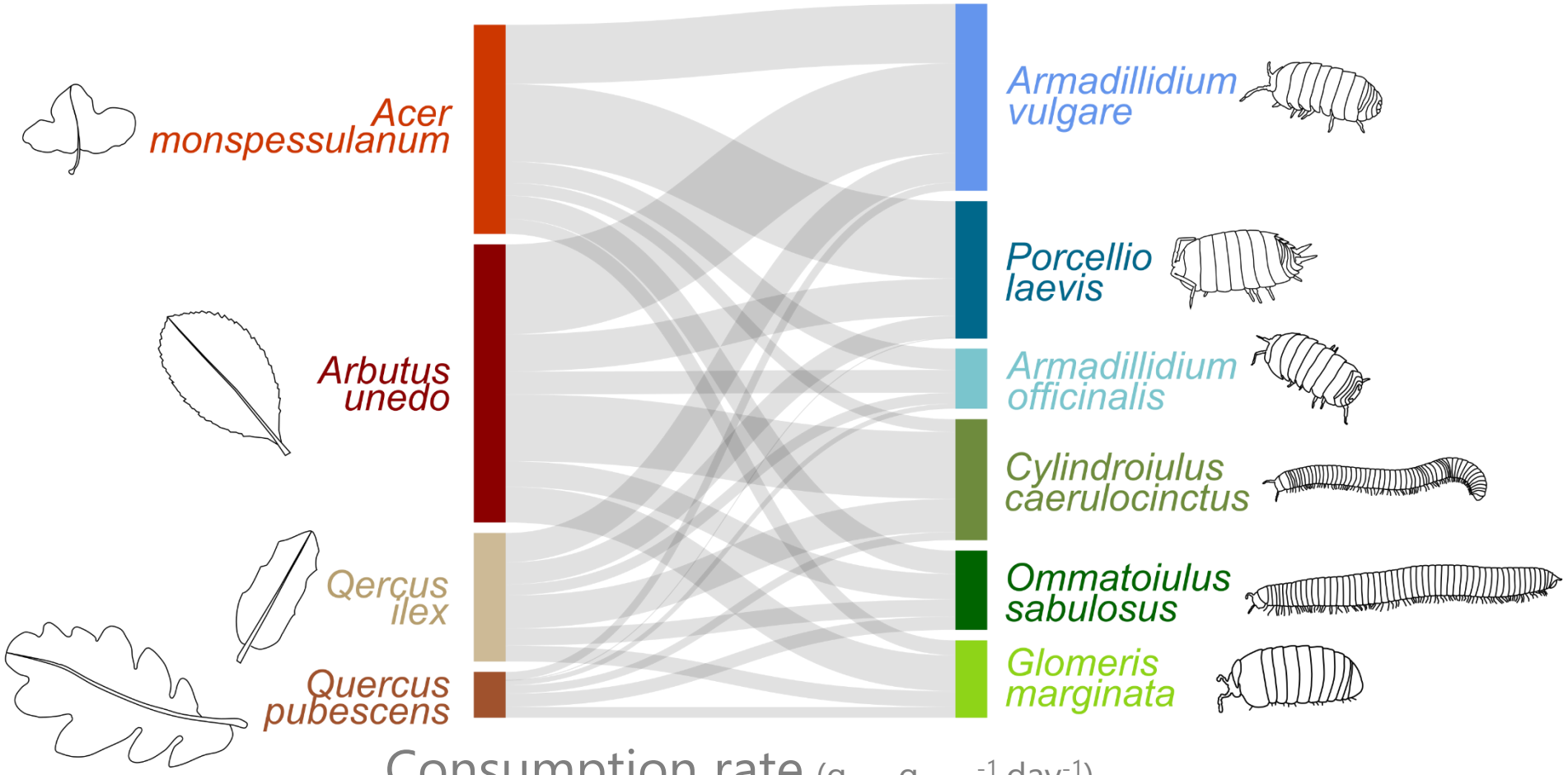




FEEDING PREFERENCES

Overall higher consumption of *A. unedo*, then *A. monspessulanum*.

Leaf tubularity → use as microhabitat and feces deposition



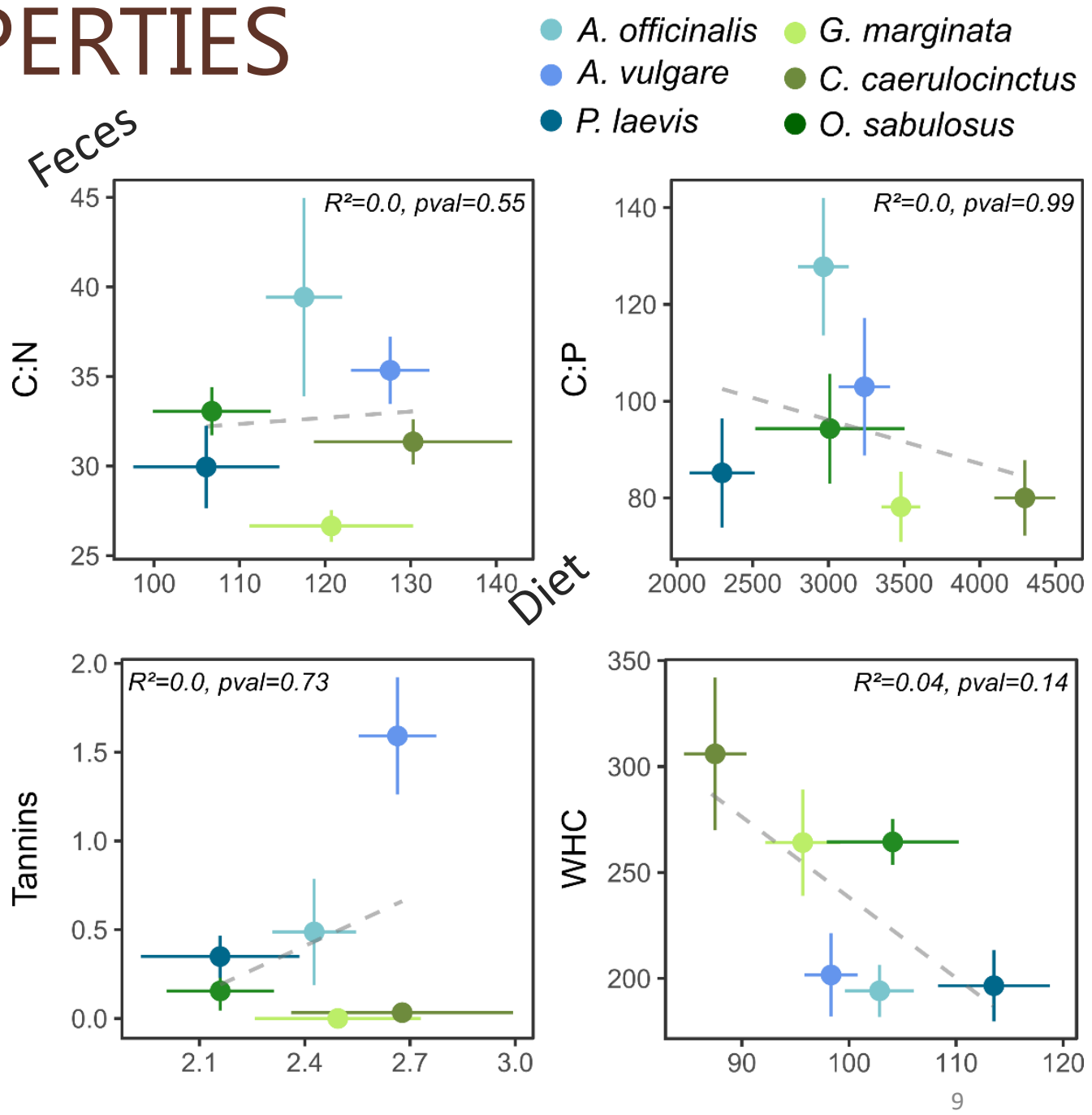
Consumption rate ($g_{leaf} \cdot g_{fauna}^{-1} \cdot day^{-1}$)

DIET AND FECES PROPERTIES

Diet and feces properties are not linked

Homogenization effect
Joly et al. 2018 *Functional Ecology*

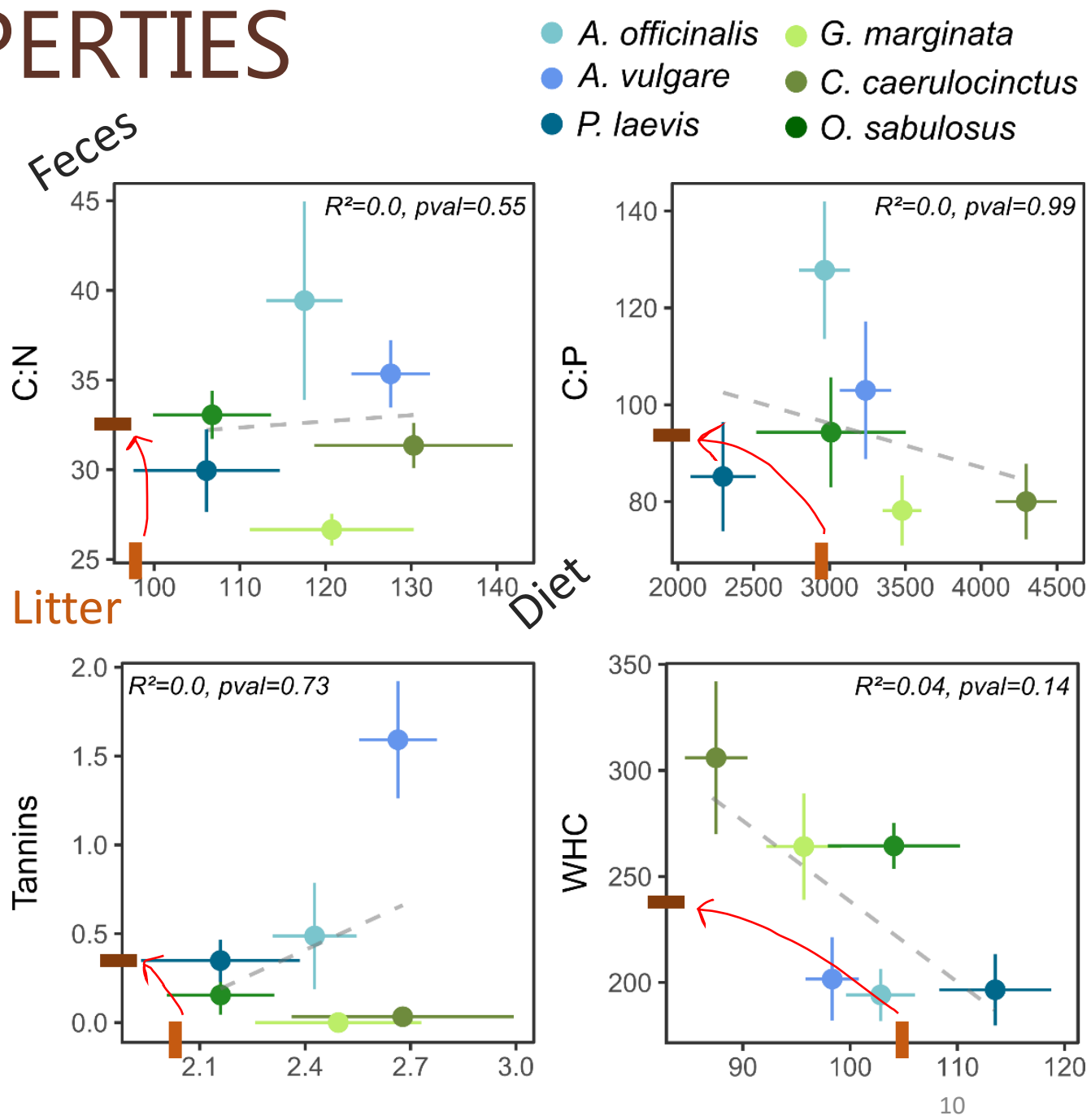
Bias in diet characterization



DIET AND FECES PROPERTIES

Feces properties more favorable for microbial activity than initial litter

	Litter	Faeces
C:N	95.6 ± 0.7^{a}	32.6 ± 6.9^{b}
C:P	2942 ± 32^{a}	95 ± 29^{b}
T	1.9 ± 0^{a}	0.4 ± 0.7^{b}
WHC	106.3 ± 0.4^{a}	237.8 ± 62.2^{b}

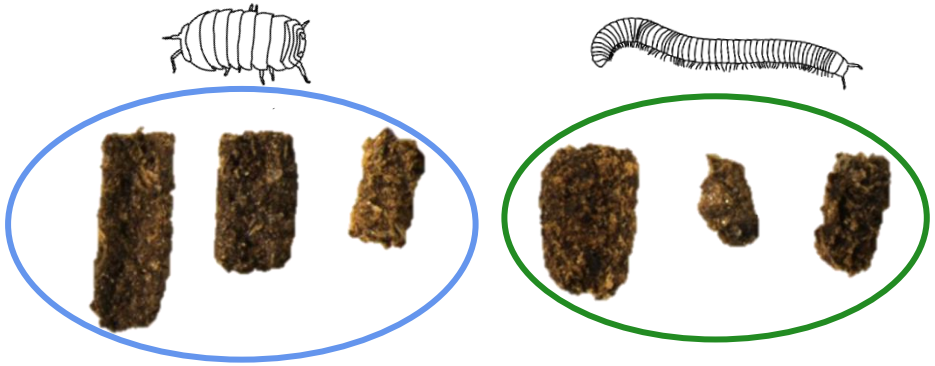


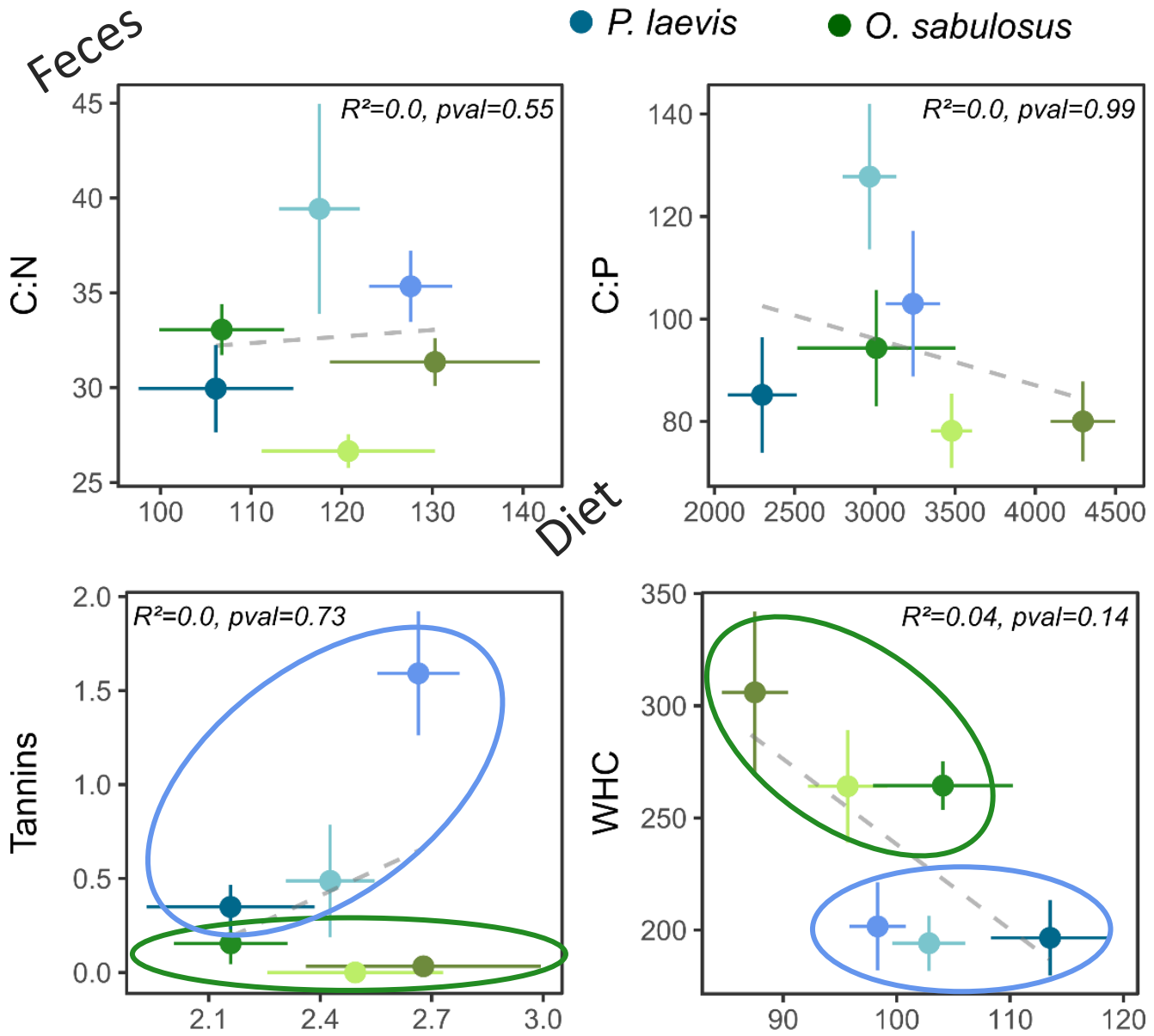
DIET AND FECES PROPERTIES

Millipede produce feces with higher WHC and lower tannins concentration

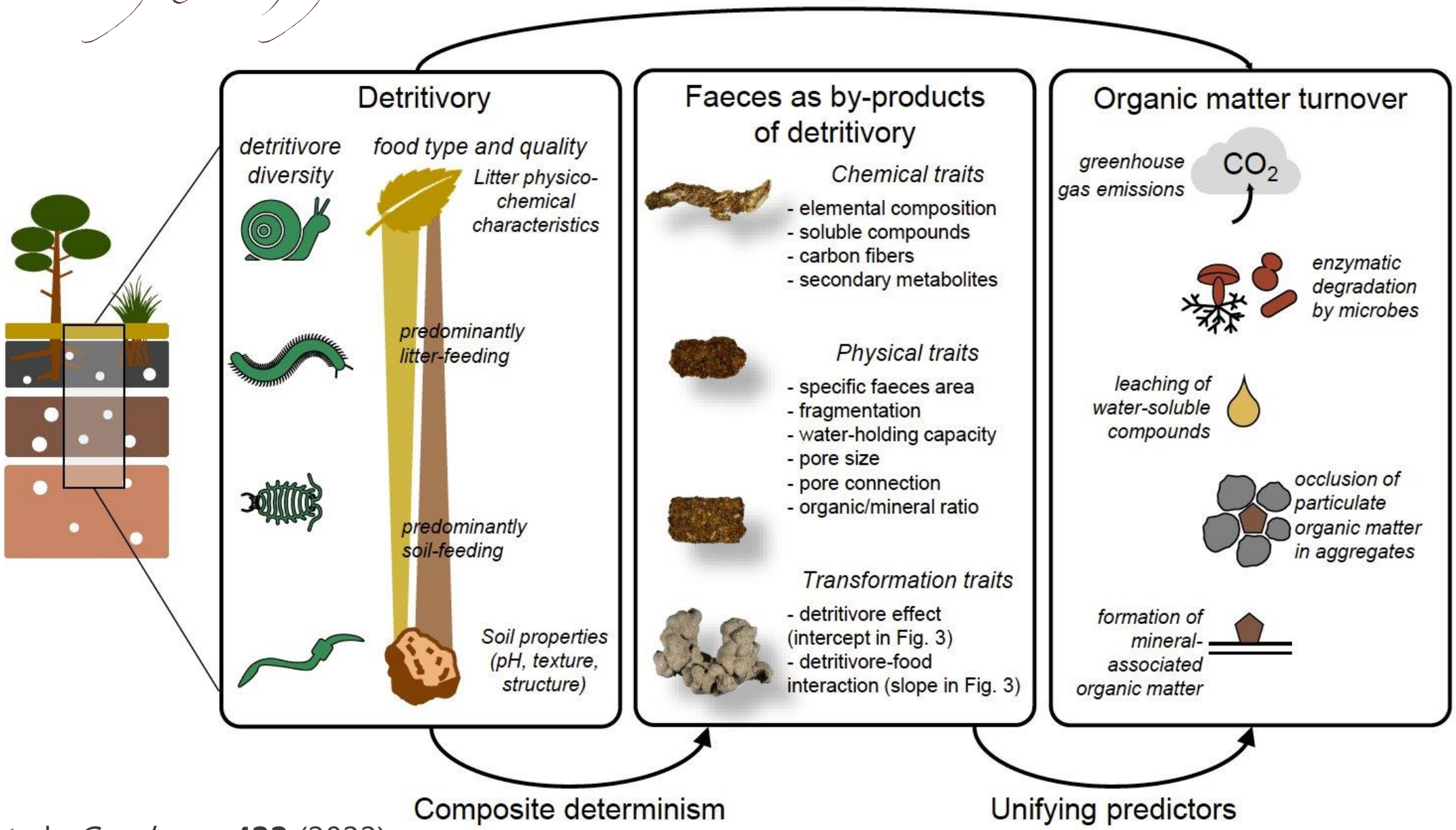
	Woodlice	Millipede
C:N	34.9 ± 8.5 [a]	30.4 ± 3.7 [a]
C:P	105 ± 33 [a]	84 ± 20 [b]
T	0.8 ± 0.8 [a]	0.1 ± 0.2 [b]
WHC	197.5 ± 34.4 [a]	278.2 ± 57.7 [b]
SFA*	4.63 ± 0.93 [a]	2.98 ± 0.75 [b]

*Specific Feces Area ($mm^2.g^{-1}$)





One trait to measure them all



Coq et al., *Geoderma* **422** (2022)

THANK YOU FOR YOUR ATTENTION

@GanaultPierre