

The performance of microannelid communities at SoilMan sites

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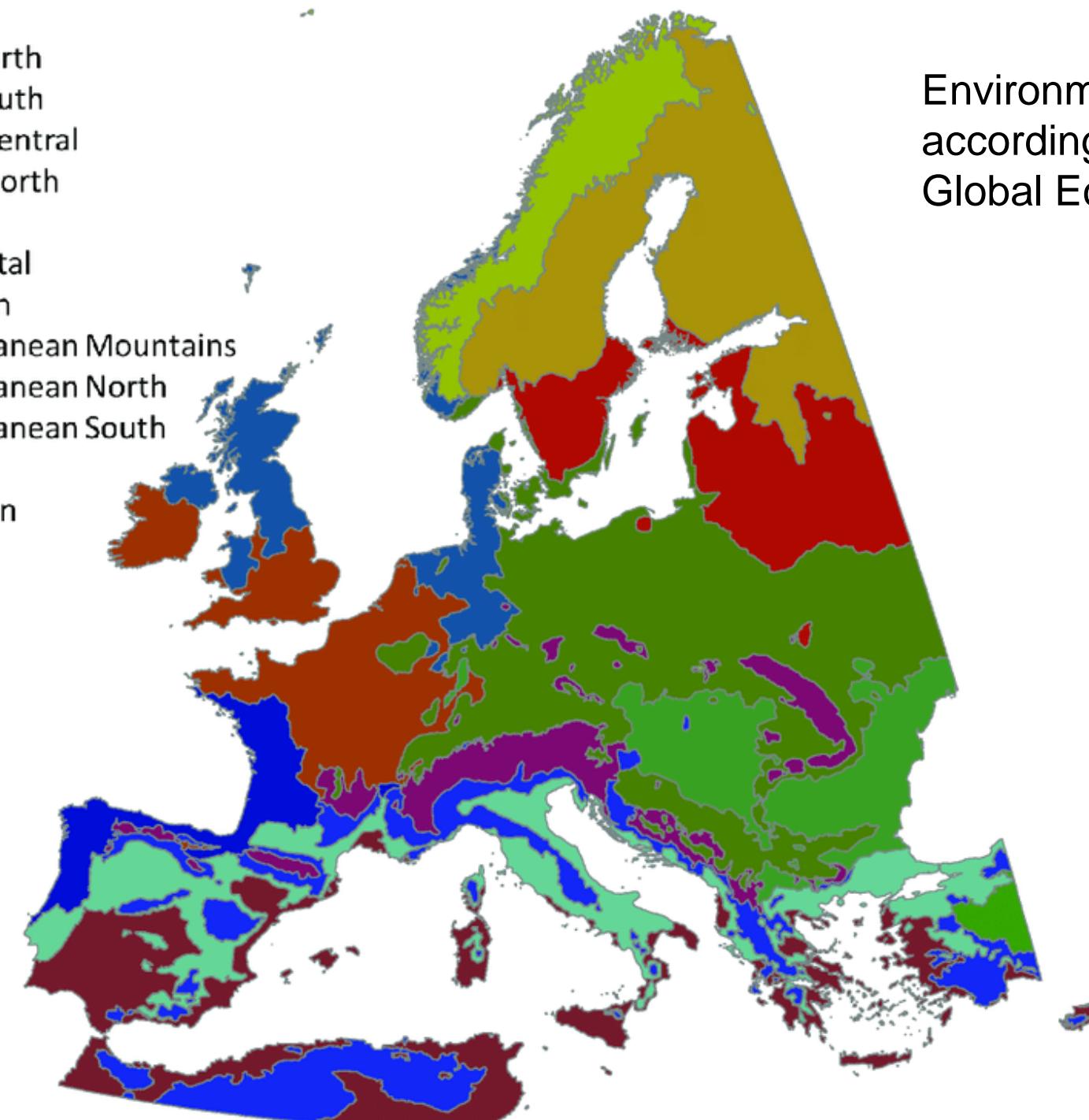
European Commission

Scientific partners:



- Microannelids are small relatives of earthworms and members of the soil mesobiome.
- Like earthworms, they contribute to the decomposition of organic matter and the formation of soil aggregates
- Taxonomically, most soil dwelling microannelids belong to the Enchytraeidae, very few to other families.
- We give an overview of total abundances, functional groups and species numbers of microannelid communities present at the SoilMan observation sites in contrasting juxtaposition of different agricultural management practices.

- Alpine north
- Alpine south
- Atlantic central
- Atlantic north
- Boreal
- Continental
- Lusitanian
- Mediterranean Mountains
- Mediterranean North
- Mediterranean South
- Nemoral
- Pannonian



Environmental Zones of Europe
according to Metzger et al.
Global Ecol. Biogeogr. (2005) 14

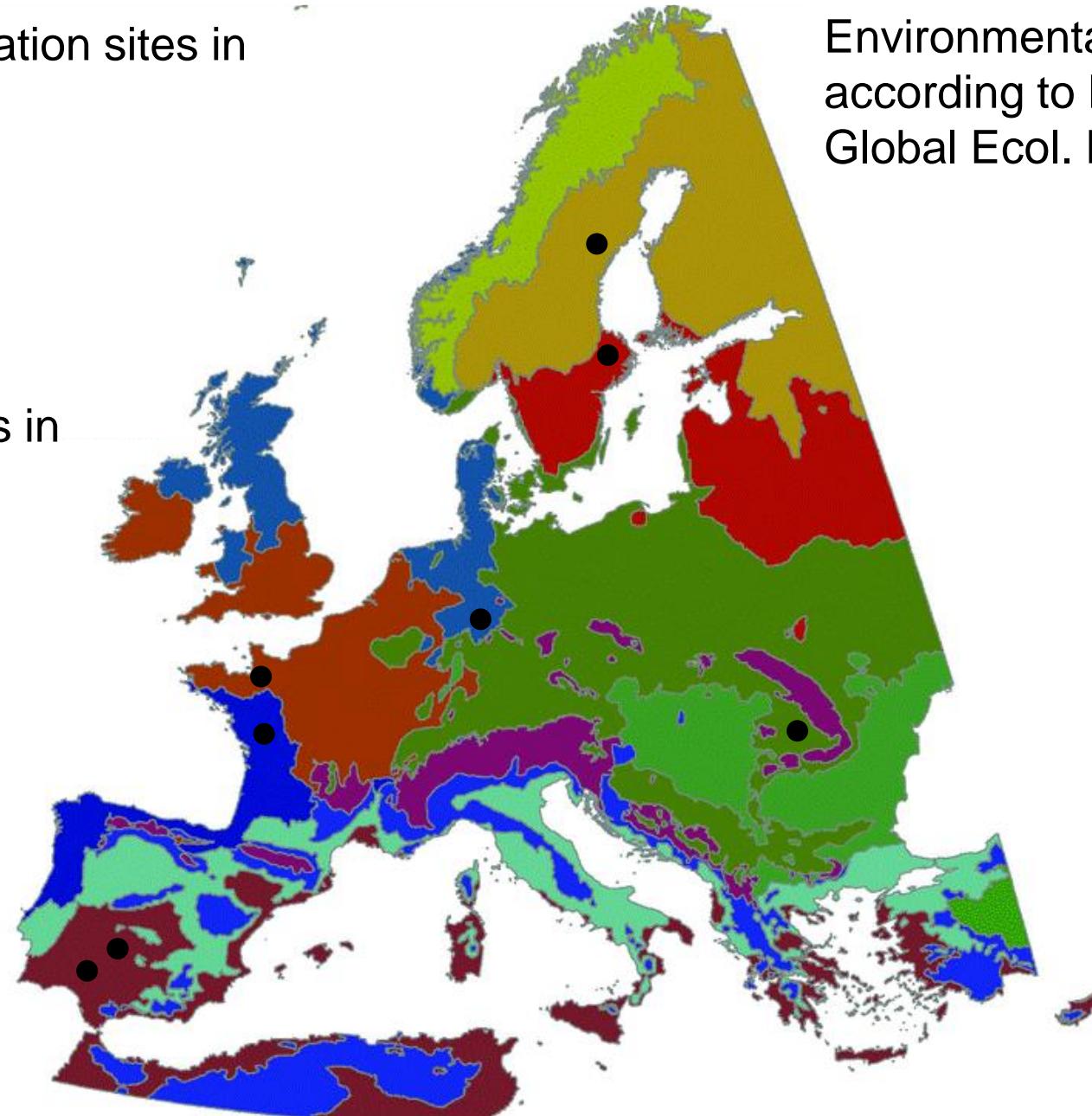
8 SoilMan long-term observation sites in

- France
- Germany
- Romania
- Spain
- Sweden

3 SoilMan field network sites in

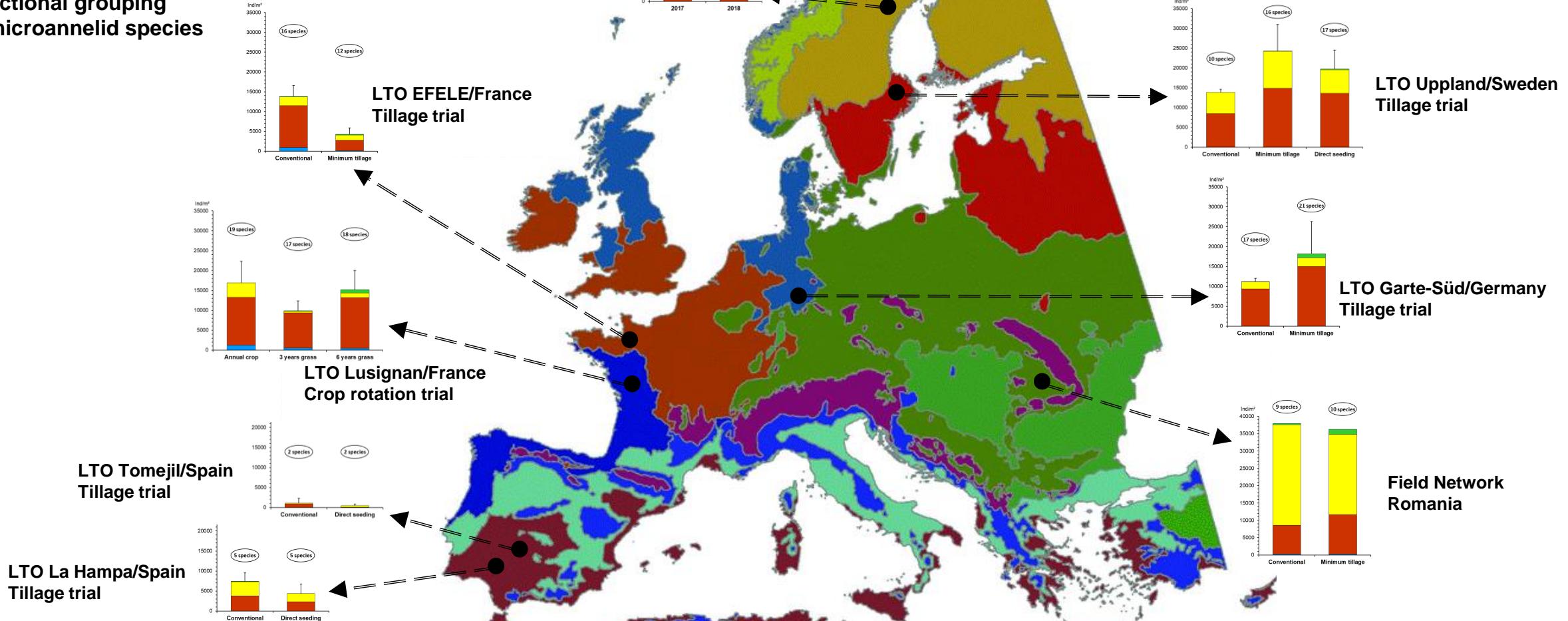
- France
- Romania
- Sweden

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█	Litter dweller	<i>Henlea, Marionina communis</i> , et al.
█	Opportunistic species	<i>Enchytraeus</i> , et al.
█	Soil dweller	<i>Fridericia, Achaeta, Enchytronia</i> , et al.
█	Deepness dweller	<i>Marionina (partim), Rhyacodrilus</i> , et al.

Functional grouping of microannelid species

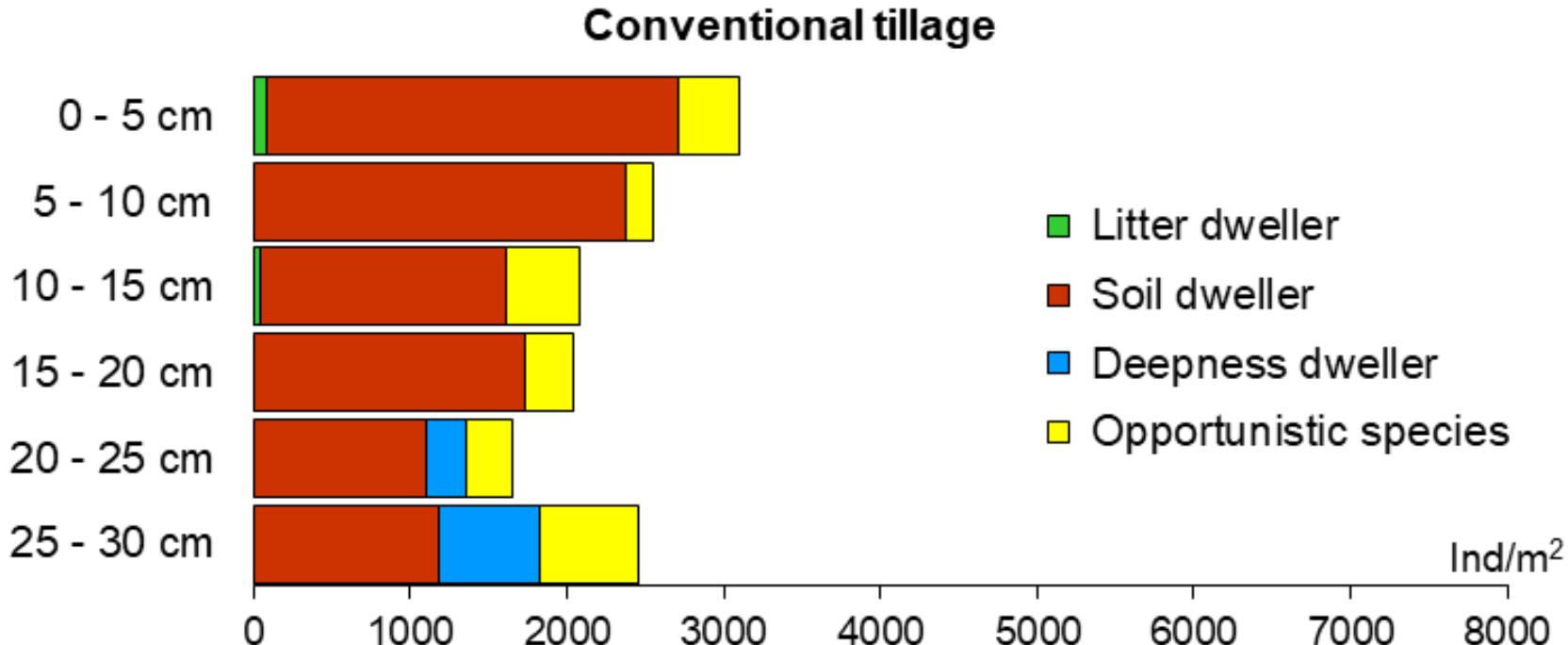


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Functional grouping of microannelid species

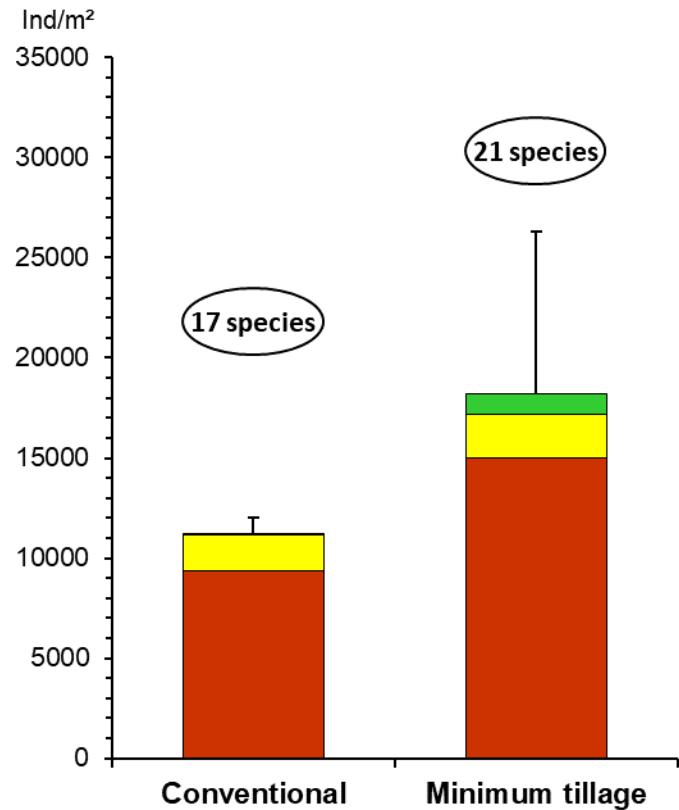
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	Opportunistic species	<i>Enchytraeus, et al.</i>
	Soil dweller	<i>Fridericia, Achaeta, Enchytronia, et al.</i>
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Parameter vertical distribution of microannelids

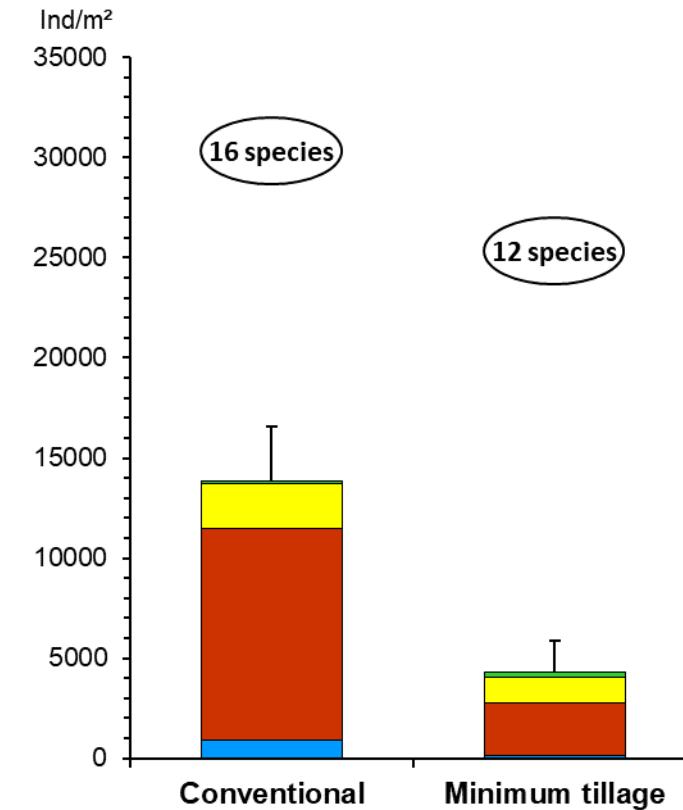


LTO EFELE/France - Tillage trial

Same treatment : obverse effect



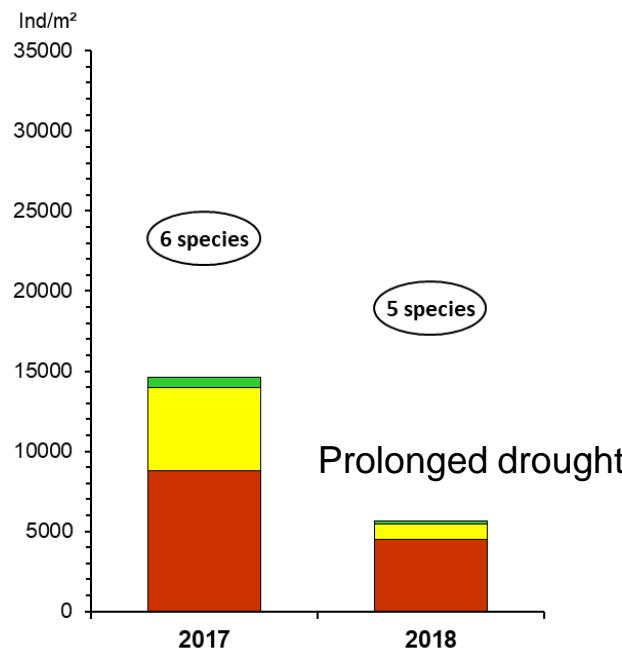
LTO Garte-Süd/Germany - Tillage trial



LTO EFELE/France - Tillage trial

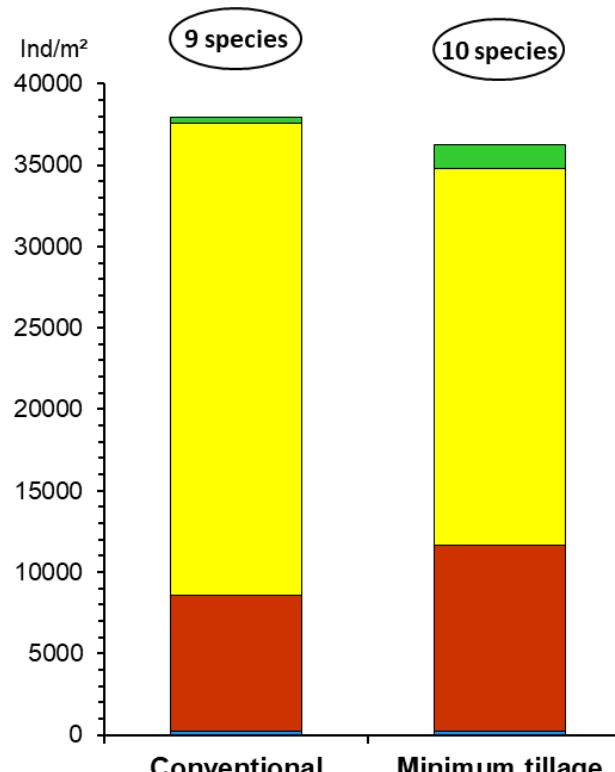
Climatic and weather effects

Boreal zone



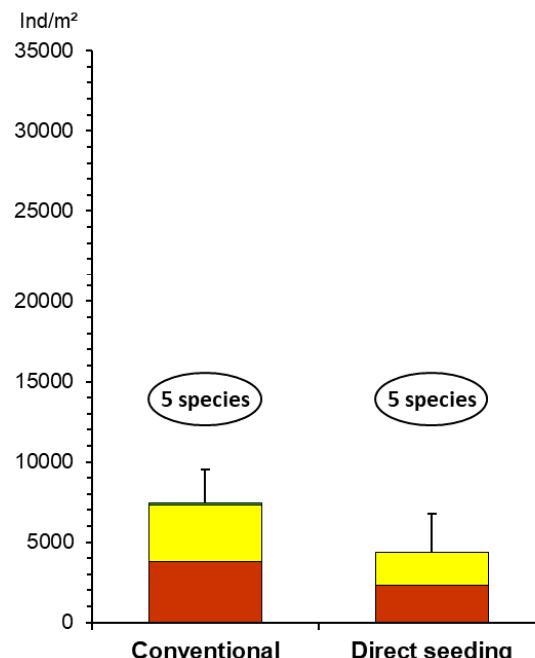
LTE Offer/Sweden - Crop rotation trial

Continental zone



Field Network Romania

Mediterranean zone



LTO La Hampa/Spain - Tillage trial

Summary I

- A total of 91 microannelid species were identified, of which 39 % are new to science still waiting to be described.
- The communities show strong similarities at all sites with respect to species and trait composition, dominated by the genera *Fridericia* and *Enchytraeus*. This structure is typical of agricultural land underlying man-made turbation referred to as “ploughing”.
- Other reasons for the resemblance of the communities result from stabilizing the pH values by fertilisation and the restriction of the study to loamy soils.

Summary II

- The tillage trials show heterogeneous results. In 47 % of the studied cases, no tillage and reduced tillage caused an increase in species diversity compared to conventional ploughing, while in 33 % a decrease and in 20 % no change occurred.
- The rotation trials, furthermore, show the sound resilience of the soil biota system as to the different treatments.

Conclusion

- In summary, none of the studied management practices is a threat to soil biodiversity and its depending ecosystem services, but rather is a prerequisite of its performance.
- However, there is evidence that climate change and loss of landscape diversity have serious consequences for the sustainability of the soil biota.