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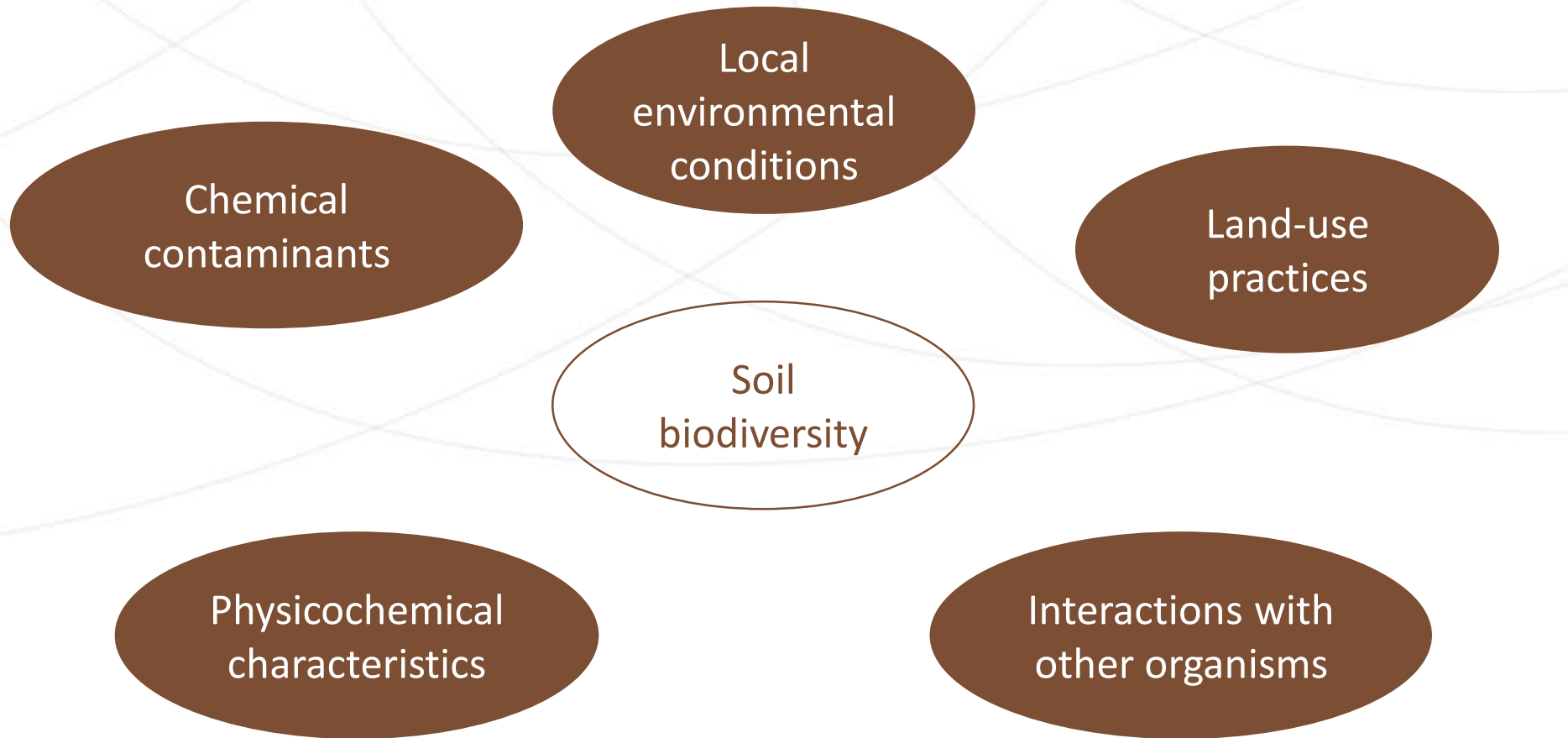
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Next generation biomonitoring to assess key species and soil parameters determining the biodiversity in agricultural soils

Borruso L, Genova G, Bani A, Signorini M, Schuler H, Brusetti L, Hilpold A,
Dumbrellm AJ, Cesco S and Mimmo T



Soil biodiversity: a valuable tool for sustainable agricultural practices

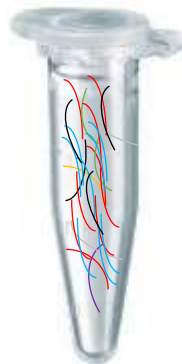


Methods of studying soil biodiversity: eDNA metabarcoding approach

Selection of a target region of DNA (16S rRNA gene, ITS region, 18S rRNA).



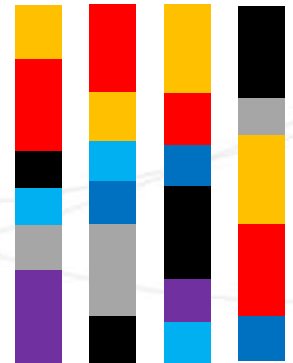
DNA
extraction



PCR on taxonomically
informative marker
genes

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atctttccggttaaactttgatttgccta
ctaggttaaagtaaacttggcctaattg
tttgatttgcctactaggttaaagtaaac
aaacttggcctaaagtaaacttggccggc
ttgccctactaatctttccggtgtaaacac
agtaaacggcctaacttggatttgcgcgcg
acttggcctaaattgctactaggttaccta
gtatttgatttgcctacttggatttgccta
cctaaagtaaacttgatttgcgcgtattt
```

High-Throughput
Sequencing



Databases for
taxonomic
assignment



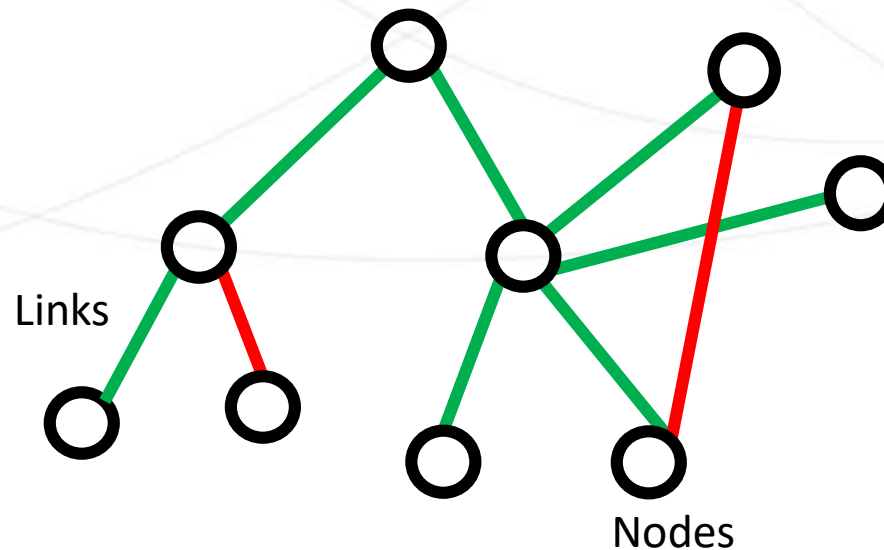
eDNA metabarcoding as tool for agro-ecosystems survey

- Target more than one species at the same time
- Tested for a wide range of environments
- Low sampling disturbance
- Less time-consuming than the classical survey
- Detecting of rare species



Agroecological networks of soil biodiversity

Agroecological networks is composed of the coexisting organisms, individuals that group together more frequently than with the rest, and the keystone species that are in the center of the network.



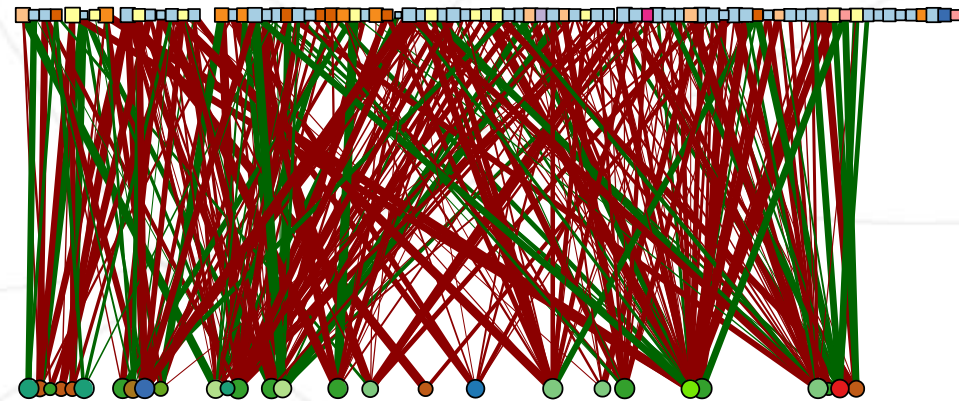
Agroecological networks of soil biodiversity



Bacteria

Fungi

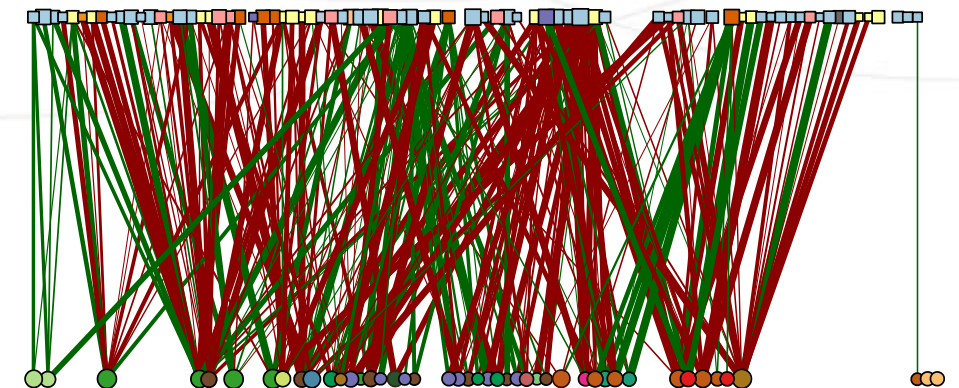
Conventional apple orchard



Bacteria

Fungi

Organic apple orchard



Take home message

- To unravel the species-species and species-soil interaction of the soil diversity
- To identify the key drivers and keystone species influencing the soil biodiversity
- To exploit better biodiversity already present in soil and to reduce the use of external inputs



Acknowledgements



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Università Lìedia de Bulsan



University of Essex

eurac
research

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