

# Working Group Meetings **International Network on Soil Biodiversity** NETSOB

7-10 February 2022 | 14:00 hrs CET

**George Brown, Embrapa Forestry**

**Carlos Guerra, iDiv**

**Guidelines for measuring, assessing and monitoring  
(MAM) soil biodiversity**





# GUIDELINES FOR MEASURING, ASSESSING AND MONITORING SOIL BIODIVERSITY

- Session 1. Introduction
- Session 2. Strategies and issues related to the design and implementation of soil biodiversity monitoring programs
- Session 3. Soil Biodiversity: Measurement, Assessment and Monitoring Methods for Micro-organisms
- Session 4. Soil Biodiversity: Macro, Meso and Megafauna Measurement, Assessment and Monitoring Methods
- Session 5. Soil Functional Measurement, Assessment and Monitoring Methods Related to Soil Biodiversity and Soil Health/Quality
- Synthesis session. Worldwide Measurement, Assessment and Monitoring of Soil Biodiversity and Soil Health/Quality: The International Network on Soil Biodiversity (NETSOB)

# Session 1. Introduction

## 1. Soil biodiversity and the need for its measurement, assessment and monitoring

general about SBD, reasoning behind the need and this publication, relationships between soil biodiversity and soil health/quality

## 2. Principles of monitoring soil biodiversity

long-term sites, choice of methods, taxa, LUS, funding and statistical issues, infrastructure, additional variables that need to be measured like environmental conditions with time, soil chemical attributes, management practices including pesticides and other agrochemicals, soil tillage, etc.

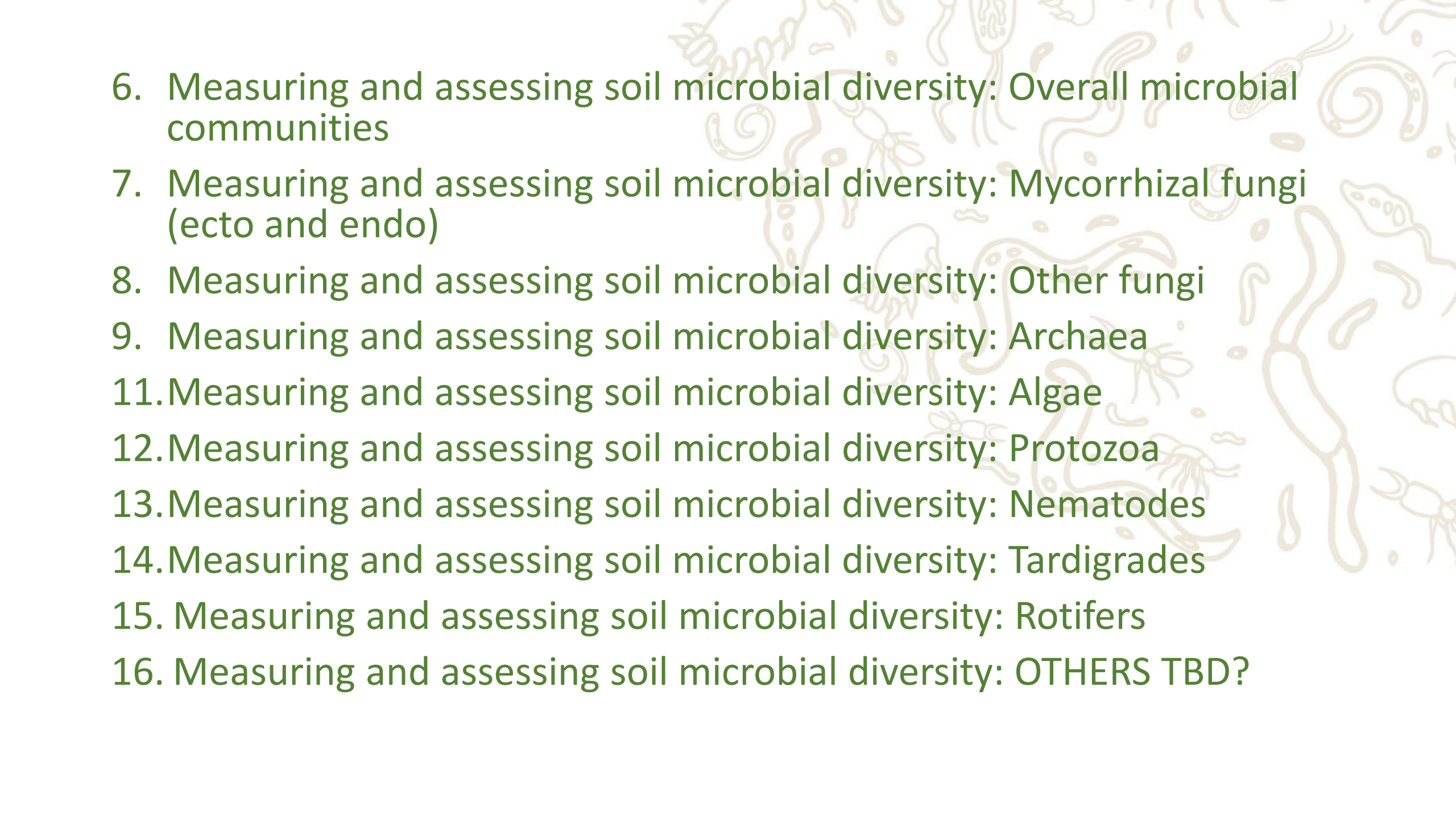
## Session 2. Strategies and issues related to the design and implementation of soil biodiversity monitoring programs

3. Sampling design and data analysis issues related to monitoring soil biodiversity  
choice of field sites, locations, replicates, number of samples
4. Legal, ethical and logistical issues related to monitoring soil biodiversity  
include reference to the impacts on the soil/disturbance and its biodiversity, regional issues regarding technological and financial capabilities to monitor, etc.
5. Data management, storage, etc.  
interaction with Glosis

# Session 3. Soil Biodiversity: Measurement, Assessment and Monitoring Methods for Micro-organisms

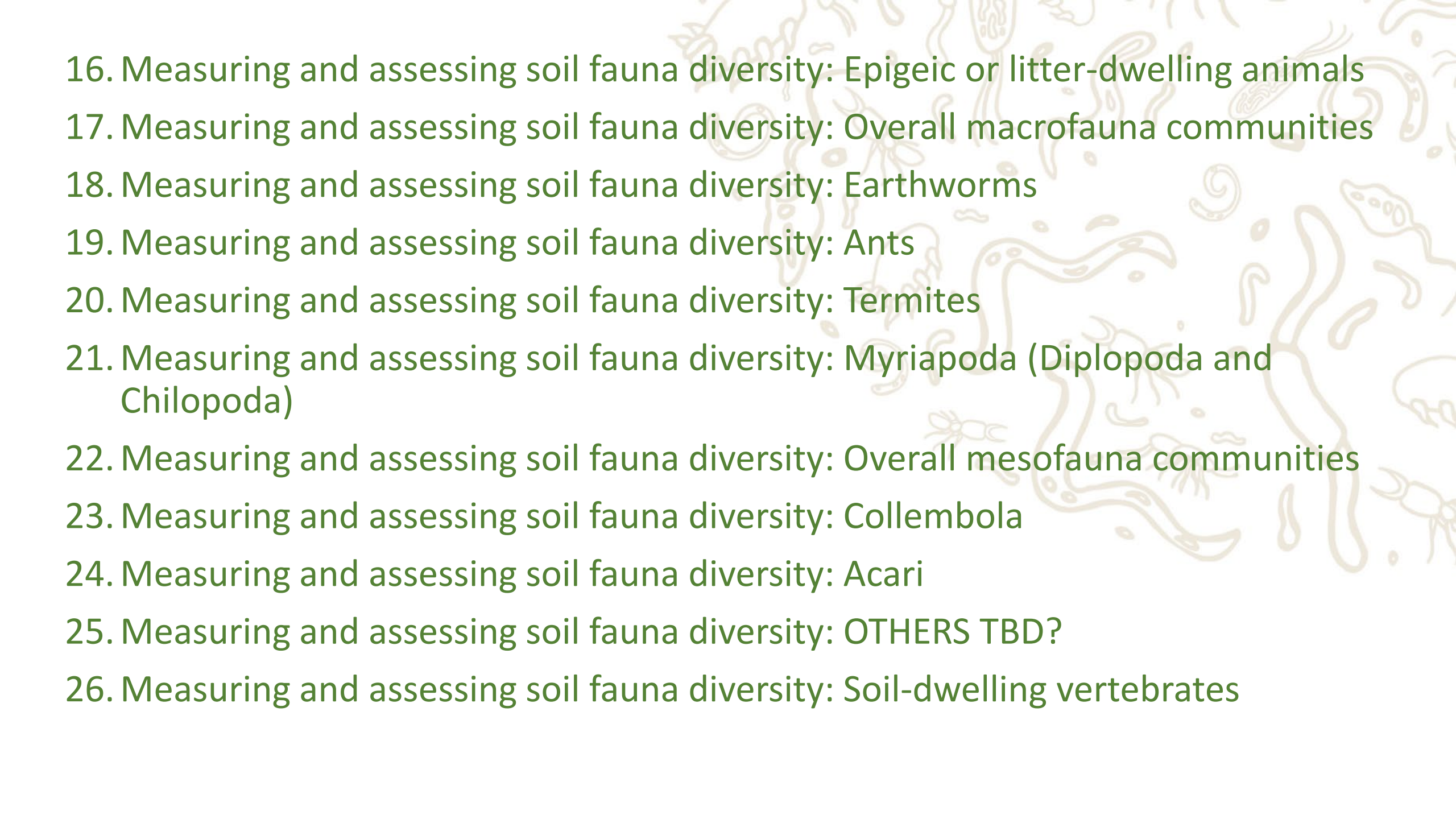
- Overall idea for each chapter: main methods used, with proposal for BEST (comparable, compatible, feasible worldwide) and any (one or 2 max) alternate methods depending on available conditions or infrastructure, but that still provide the necessary information and that are comparable.
- Step-by-step method, like a SOP, with lab and field equipment needed, timing, people, etc.
- When identification keys are available, provide at different levels, at higher (order) or lower (genus, species) taxonomic ID level, when possible. Molecular vs. morphological techniques for each group.



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6. Measuring and assessing soil microbial diversity: Overall microbial communities
  7. Measuring and assessing soil microbial diversity: Mycorrhizal fungi (ecto and endo)
  8. Measuring and assessing soil microbial diversity: Other fungi
  9. Measuring and assessing soil microbial diversity: Archaea
  11. Measuring and assessing soil microbial diversity: Algae
  12. Measuring and assessing soil microbial diversity: Protozoa
  13. Measuring and assessing soil microbial diversity: Nematodes
  14. Measuring and assessing soil microbial diversity: Tardigrades
  15. Measuring and assessing soil microbial diversity: Rotifers
  16. Measuring and assessing soil microbial diversity: OTHERS TBD?

# Session 4. Soil Biodiversity: Macro, Meso and Megafauna Measurement, Assessment and Monitoring Methods

- Overall idea for each chapter: main methods used, with proposal for BEST and any (one or 2 max) alternate methods depending on available conditions/infrastructure, but that still provide the necessary information and that are comparable.
- Step-by-step method, like a SOP, with lab and field equipment needed, timing, people, etc.
- When identification keys are available, provide at different levels, at higher (order) or lower (genus, species) taxonomic ID level, when possible.

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16. Measuring and assessing soil fauna diversity: Epigeic or litter-dwelling animals
  17. Measuring and assessing soil fauna diversity: Overall macrofauna communities
  18. Measuring and assessing soil fauna diversity: Earthworms
  19. Measuring and assessing soil fauna diversity: Ants
  20. Measuring and assessing soil fauna diversity: Termites
  21. Measuring and assessing soil fauna diversity: Myriapoda (Diplopoda and Chilopoda)
  22. Measuring and assessing soil fauna diversity: Overall mesofauna communities
  23. Measuring and assessing soil fauna diversity: Collembola
  24. Measuring and assessing soil fauna diversity: Acari
  25. Measuring and assessing soil fauna diversity: OTHERS TBD?
  26. Measuring and assessing soil fauna diversity: Soil-dwelling vertebrates



# Session 5. Soil Functional Measurement, Assessment and Monitoring Methods Related to Soil Biodiversity and Soil Health/Quality

- Overall idea for each chapter: main methods used, with proposal for BEST and any (one or 2 max) alternate methods depending on available conditions/infrastructure, but that still provide the necessary information and that are comparable.
- Step-by-step method, like a SOP, with lab and field equipment needed, timing, people, etc.

27. Measuring, assessing and monitoring soil health/quality using soil microbial biomass and respiration
28. Measuring, assessing and monitoring soil health/quality using soil enzymes
29. Measuring, assessing and monitoring soil health/quality using other soil microbial variables related to soil quality and biodiversity (e.g., glomalin, mycorrhizal fungi colonization, N<sub>2</sub> fixation)
30. Measuring, assessing and monitoring soil health/quality using soil bioturbation and biological aggregation
31. Measuring, assessing and monitoring soil health/quality using soil organic matter decomposition (teabags, litterbags, bait lamina)
32. Measuring, assessing and monitoring soil habitat quality through ecotoxicological tests with soil microorganisms
33. Measuring, assessing and monitoring soil habitat quality through ecotoxicological tests with soil mesofauna
34. Measuring, assessing and monitoring soil habitat quality through ecotoxicological tests with soil macrofauna
35. OTHERS TBD?

# Synthesis Session. Worldwide Measurement, Assessment and Monitoring of Soil Biodiversity and Soil Health/Quality: The International Network on Soil Biodiversity (NETSOB)

- Overall idea of session: Reasoning behind the proposal, and summary/table of main methods proposed for monitoring worldwide, with description of minimum assessments needed for overall syntheses/comparisons worldwide
- proposal of basic LUS for assessment, as well as orientations on getting the work done within country and in collaboration with worldwide labs
- identification of needs for capacity building and infrastructural or resource allocations in order to do the work
- list of partners and participating institutions/labs





Food and Agriculture  
Organization of the  
United Nations

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