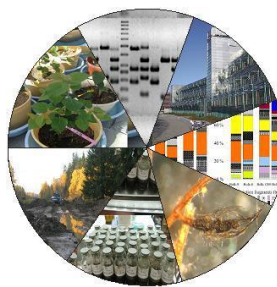


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Techniques currently in use in MEM-group:

Molecular methods:

- DNA/RNA isolation from soils, plants, micro-organisms and peat
- PCR amplification of microbial marker genes (16S rRNA gene universal/group specific, *mcrA*, fungal ITS region, extradiol dioxygenases (EDOs) and alkane monooxygenase (*alkB*))
- Clone library construction (PCR amplicons, megaplasmid fragments)
- Restriction fragment length polymorphism (RFLP)
- Terminal restriction fragment length polymorphism (T-RFLP)
- Sanger sequencing of PCR products and plasmids
- qPCR in mRNA expression analysis and microbial enumeration

Microbiology methods:

- Cultivation of micro-organism (soil, plant endophytes, rhizosphere)
- Most Probable Number (MPN) technique with diesel oil
- Biodegradation assay (aromatic compounds, PAHs)

- *In vitro* endophyte inoculations to host plant
- Test for antagonism

Other methods:

- Methane production potential in peat
- Fungistasis biotests
- *In vitro* cultivation of aspen
- Cultivation of aspen seedlings
- Root morphology

Bioinformatics:

- DNA sequence analysis
- Phylogenetic analysis
- Multivariate analysis of microbial population data

Techniques you would like to implement:

- Enriching microbial DNA from plant tissues
- Illumina sequencing (metatranscriptomics, plant microbial metagenomics, marker genes)
- Bioinformatics in massive parallel sequencing
- SIP
- FISH
- EM

Projects:

Improving the biomass production and phytoremediation of aspen in marginal lands with added microbes (ABIOREM) Kim Yrjälä, Shinjini Mukherjee, Timo Sipilä

Tree- micro-organism interactions in extreme conditions; the efficient use of information on different levels of experimental practice Kim Yrjälä, Shinjini Mukherjee, Timo Sipilä

Missing microbial link in methane production of peatlands – the search of fermentative bacteria and fungi Heli Juottonen, Kim Yrjälä

Metagenomics of petroleum hydrocarbon polluted soil to benefit bioremediation: resilience of bacteria in pollution Shinjini Mukherjee, Kim Yrjälä

Soil resources and soil microbial processes in agro-environments Timo Sipilä, Kim Yrjälä