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Authors: Eva Högfors-Rönnholm, Stephan Christel, Sten Engblom, Mark Dopson

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Indirect DNA extraction method suitable for acidic soil with high clay content

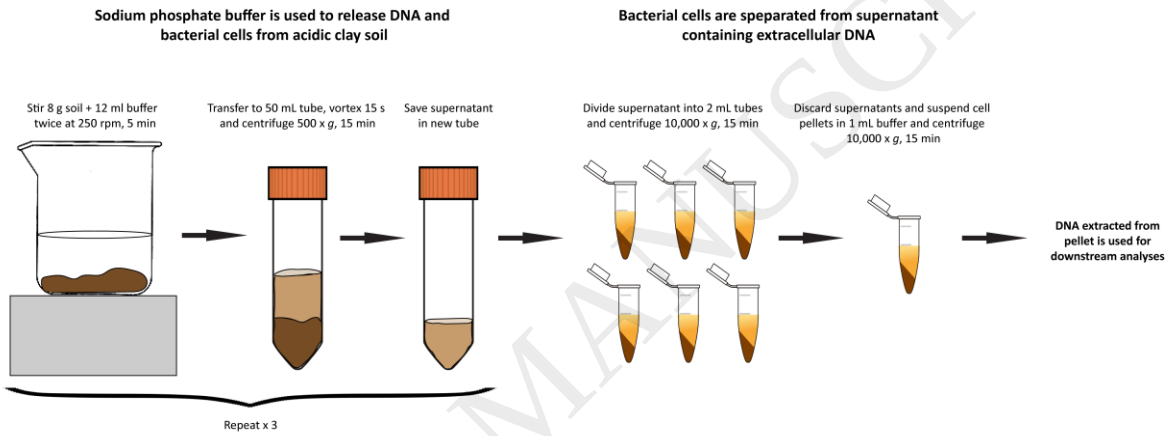
Eva Högfors-Rönnholm[a,*], Stephan Christel[b], Sten Engblom[a], Mark Dopson[b]

[a] Research and Development, Novia University of Applied Sciences, Vaasa, Finland

[b] Centre for Ecology and Evolution in Microbial Model Systems (EEMiS), Linnaeus University, Kalmar, Sweden

Contact email: *eva.hogfors-ronnholm@novia.fi (E. Högfors-Rönnholm)*

Graphical abstract



Abstract

DNA extraction is an essential procedure when investigating microbial communities in environmental samples by sequencing technologies. High clay soils can be problematic as DNA adsorbs to the clay particles and can thereby be preserved from lysed, non-viable cells for a substantial period of time. In order to accurately estimate the intact and living microbial community in the soil, extracellular DNA from dead, remnant bacterial cells needs to be removed prior to DNA extraction. One possibility is to use a sodium phosphate buffer to release both extracellular DNA and bacterial cells from the clay particles. After removing the extracellular DNA by centrifugation, the remaining viable cells can be harvested and DNA extracted. The described method is a modification of a procedure for separating extracellular DNA and bacterial cells from acidic clay soils.

- The modified method increases bacterial cell yields from acidic clay soils, such as acid sulfate soil.
- The modified method eliminates some steps from the original method, as only DNA from intact bacterial cells is required.
- The indirect DNA extraction method increases the workload compared to standard direct extraction methods, but subsequent downstream analyses will give a more representative picture of the viable microbial community composition in the soil.