Valentina Sechi, Lijbert Brussaard, Ron de Goede, Michiel Rutgers and Christian Mulder: Allometric scaling of soil food webs forecasts biotic interactions and trait-based ecosystem functioning, 43rd Annual Meeting of the Ecological Society of Germany, Austria and Switzerland, Potsdam, Germany, 9-13 September 2013 (Poster presentation).

Plant traits have been widely used to evaluate ecosystem functioning but there are few examples of trait-based approaches to assess soil ecological processes. Recent studies on soil biota showed that species' numerical abundances and body-mass averages are functional trait proxies for ecosystem structure (Mulder et al., Adv. Ecol. Res. 2011, 2012). The exploration of changes in the faunal body-mass distribution under different environmental conditions allows the identification of trait-mediated belowground responses to aboveground pressure. Allometry as such can thus be used as an integrated measure for the anthropogenic influence on soil food webs (Mulder and Elser, Global Change Biol. 2009). To validate this approach at local scale, we selected a former organic, currently abandoned, grassland as a reference for an undisturbed soil community. We investigated all the organisms belonging to bacteria, fungi, protozoans, nematodes, micro-arthropods and oligochaetes from both a taxonomic and a functional perspective. In contrast to previous studies, amoebae and flagellates were included. Protozoans perfectly filled the gap of five orders of magnitude between the body masses of nematodes and bacterial cells, with significantly constant scaling coefficients at both taxonomical and functional levels. After plotting functional groups and operational taxonomic units (OTUs) into a body mass - numerical abundance log-log plane, we saw the universal 3/4 scaling confirmed regardless of data lumping or chosen species combination.