S11.04-P -15

MODIFICATION OF A COMMERCIAL DNA EXTRACTION KIT TO SIMULTANEOUSLY RECOVER RNA, SAFELY AND RAPIDLY, AND TO ASSESS MOLECULAR BIOMASS OF THE TOTAL AND THE ACTIVE PART OF MICROBIAL COMMUNITIES, FROM SOILS WITH DIVERSE MINERALOGY AND CARBON CONTENT.

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*We have modified a commercial DNA extraction kit for soil to simultaneously co-extract RNA. In this new procedure RNA and DNA are separated by two selective purifications in cascade without the need of DNAase or RNAse digestion. Consequently DNA and RNA are respectively purified from the whole co-extraction solution. Nucleic acids extraction is based on the action of SDS coupled with an efficient bead-beating step, but it does not require any solvent. Avoiding the use of solvents, which are damaging for human health and environmental quality, was one of our most important motivations to develop this protocol. In a second time, we have optimized this protocol to improve the DNA and RNA yield, but kipping those yields below the saturation limit of the kit to assess and quantify the variations of molecular biomass of the total (DNA) and the active (RNA) part of microbial communities in natural samples. We have also introduced a first step of homogenization of soil sample in liquid nitrogen to improve the reliability of the fungal 18S gene sequence quantification. Finally, we have shown that this protocol can be applied to a wide diversity of soils whatever their mineralogy and metal content (2 Ferralsols, 1 Vertisol, 2 Andosols from Madagascar), texture or biomass content (1 poor sandy soil from Congo and one carbon rich temperate soil sample submitted or not to a 1 month cold stress). * E Tournier, L. Amenc and AL. Pablo contributed equally to this study.*