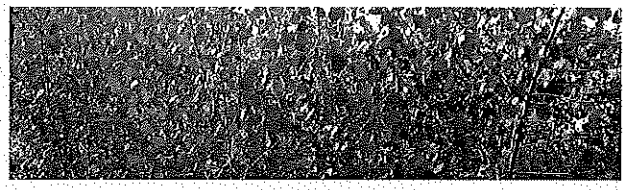
Long-term effects of phytomanagement with *Populus sp.* on soil biodiversity

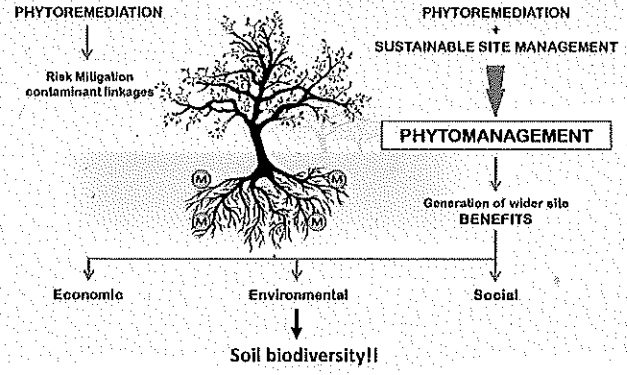
Lur Epelde*[1], Erik Urionabarrenetxea[1,2], Mikel Anza[1], Paula M.L. Castro[3], Michel Mench[4], Helena G. Moreira[3], Sofia I. A. Pereira[3], Ángeles Prieto-Fernández[5], Beatriz Rodríguez-Garrido[5], Carmen Trasar-Cepeda[5], Juan Vilela[6], Manu Soto[2], Carlos Garbisu[1]

[1]NEIKER-Basque Institute for Agricultural Research and Development. Basque Research and Technology Alliance (BRTA). Parque Científico y Tecnológico de Bizkaia, P812, 48160 Derio, Spain
[2]Cell Biology in Environmental Toxicology (CBET) Research Group, Dept. Zoology and Animal Cell Biology, Faculty of Science and Technology and Research Centre for Experimental Marine Biology and Biotechnology PIE-UPV/EHU, University of the Basque Country UPV/EHU, 48080, Bilbao, Basque Country, Spain
[3]Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Porto, Portugal
[4]Univ. Bordeaux, INRAE, BIOGECO, 33615 Pessac cedex, France
[5]MBG-CSIC sede Santiago de Compostela, Avda. de Vigo s/n, 15705 Santiago de Compostela, Spain
[6]CEA, Centro de Estudios Ambientales de Vitoria-Gasteiz, c/ Pintor Teodoro Doublang 25, 01008 Vitoria-Gasteiz, Spain

INTRODUCTION

Soil metal contamination is a worldwide problem of great magnitude. Phytomanagement is based on the use of plants to reduce and control risks arising from soil pollution while at the same time restoring and generating other wider site services. The PHY2SUDOE project maintains a network of contaminated sites that have been under phytomanagement for between 5 and 14 years in Portugal, Spain and France. The objective of this study was to evaluate the long-term effects of phytomanagement with *Populus sp.* on soil biodiversity and complexity at different levels of the trophic web.



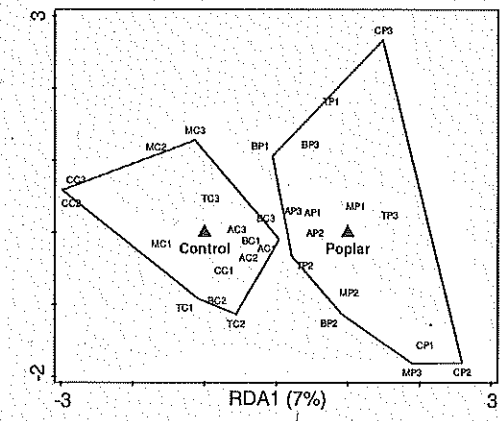


METHODOLOGY

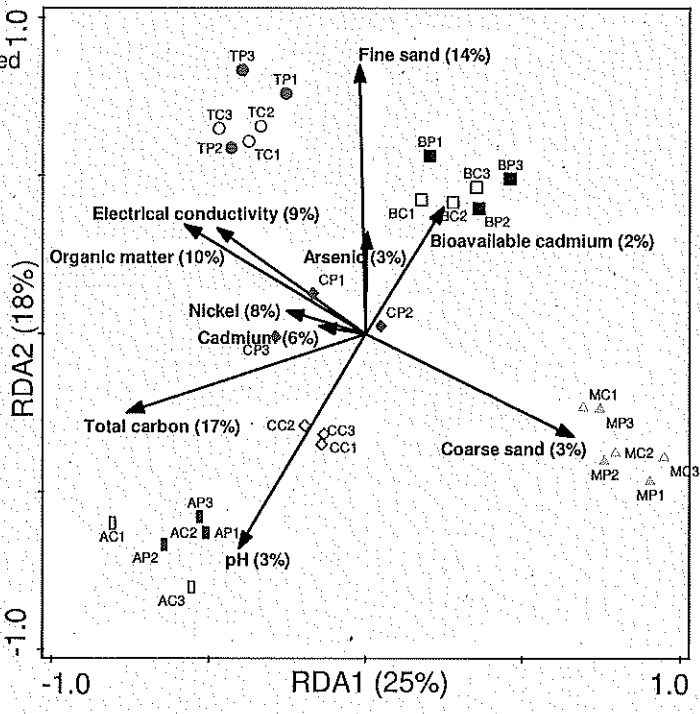
Composite soil samples were taken in the contaminated sites M_ST Médard D'Eyrans (Gironde, FR), C_Chaban-Delmas (Gironde, FR), B_Borralha (Montalegre, PT), A_Ariñez (Vitoria-Gasteiz, ES) and T_Touro (Galicia, ES), both under P_phytomanagement and C_non-phytomanaged controls. Then, metabarcoding analyses of 16S rRNA, ITS, 18s rRNA y COI genes were carried out. A complete physicochemical characterization of the samples was also performed.

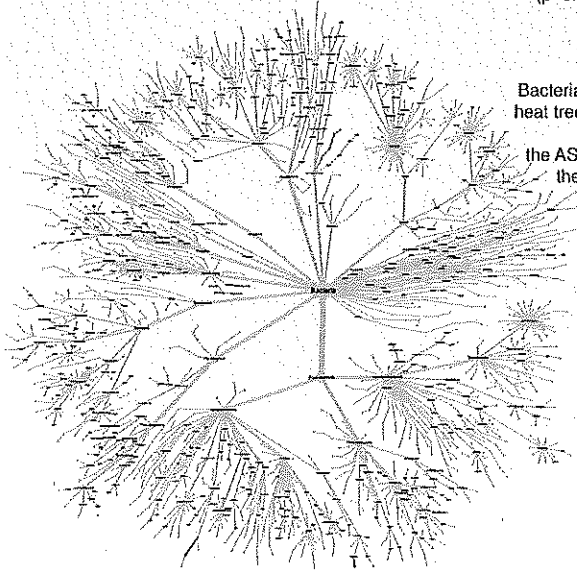
RESULTS

The site-specific soil physicochemical properties had a major influence on the soil biota. In general, alpha diversity was not affected by phytomanagement with *Populus sp.* However, this treatment significantly explained a small % of the variability in composition.

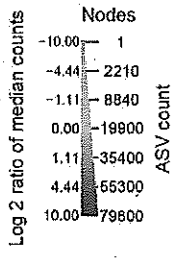


Redundancy analyses performed on (right) fungal composition with significant physicochemical properties as explanatory variables (p=0.002) and (left) prokaryotic composition with phytomanagement treatment as explanatory variable and site as covariable (p=0.028).





Bacterial differential heat tree. Node size represents the ASV count and the colours the statistically significant differences in median counts



NEXT STEPS

We are now looking for specific taxa influenced by the phytomanagement treatment. We also aim to evaluate trophic interactions.

CONCLUSIONS

Given the essential functions it performs in contaminated soils, phytomanagement practices should aim to restore soil biodiversity.

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