

EGU21-16276

<https://doi.org/10.5194/egusphere-egu21-16276>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Bioextracts of *Lavandula pedunculata* growing in São Domingos mine: a natural source of added-value compounds

Maria Manuela Abreu<sup>1</sup>, **Erika Santos**<sup>2</sup>, Maria Balseiro-Romero<sup>3</sup>, and Felipe Macías<sup>4,5</sup>

<sup>1</sup>Universidade de Lisboa, Instituto Superior de Agronomia, Linking Landscape, Environment, Agriculture and Food Research Centre, Lisboa, Portugal (manuelaabreu@isa.ulisboa.pt)

<sup>2</sup>Universidade de Lisboa, Instituto Superior de Agronomia, Linking Landscape, Environment, Agriculture and Food Research Centre, Lisboa, Portugal (erikasantos@isa.ulisboa.pt)

<sup>3</sup>Departamento de Edafología y Química Agrícola, Facultad de Biología, Universidad de Santiago de Compostela, Santiago de Compostela, Spain (maria.balseiro@usc.es)

<sup>4</sup>Departamento de Edafología y Química Agrícola, Facultad de Biología, Universidad de Santiago de Compostela, Santiago de Compostela, Spain (felipe.macias.vazquez@usc.es)

<sup>5</sup>Instituto de Investigaciones Tecnológicas. Universidad de Santiago de Compostela, Santiago de Compostela, Spain

Some autochthonous plant species with aromatic and medicinal properties are able to naturally colonize contaminated soils from mining areas from Iberian Pyrite Belt contributing to their rehabilitation. A study was carried out in order to characterize and valorise an autochthonous species, which has adequate ecophysiological behaviours for phytostabilization of mining areas, as new sources of bioactive substances. The main aims of this study were to: i) characterise the phytochemical profile of the bioextracts from shoots of *L. pedunculata* growing in soils from São Domingos mining area and a control area; and ii) evaluate the influence of potentially hazardous elements (PHEs) accumulated in the shoots on the quality of the bioextracts.

Composite samples of soils, developed on mine wastes and/or host rocks, as well as *Lavandula pedunculata* shoots were collected in São Domingos mine (Iberian pyrite Belt, SE of Portugal) and in a reference area with non-contaminated soils and the same climatic conditions. Classical characterisation of soils and total concentrations of potentially hazardous elements in soils and plant shoots were determined. The bioextracts from *Lavandula pedunculata* shoots were obtained by an accelerated solvent extractor, and the compounds were analysed by GC-MS. Extracts were extracted with hexane and major components were quantified.

The total concentrations of some potentially hazardous elements (e.g. As, Cu, Pb and Zn) were higher in soils from São Domingos than in reference area. However, soils from São Domingos are considered as contaminated with As, Cu, Pb and Sb for agriculture and residential/parkland uses. Concentrations of the PHEs (excepted Cr and Mn) in the shoots collected in São Domingos mine were higher than in the non-contaminated area

In the *L. pedunculata* extracts, obtained in the single extraction with hexane, were identified 34 compounds accounting between 79 and 89 % of the total identified compounds. Camphor was the major component in all extracts but Fenchone, eucalyptol, verbenone, bornyl acetate, borneol and

linalool oxide cis also showed considerable amounts. All these compounds present economic interest. Some variation was obtained in the qualitative composition of the *L. pedunculata* extracts but, in general, it was not clear the differentiation between populations and, consequently, soil contamination level and concentrations of the potentially hazardous elements in shoots. Environmental rehabilitation of mining areas from Iberian Pyrite Belt with this species can provide economic valorisation by the exploration of this plant-based product for fragrance and pharmaceutical industries.

Acknowledgment: This research was supported by Portuguese funds, through Fundação para a Ciência e Tecnologia within the scope of the project UID/AGR/04129/202, and Xunta de Galicia (GRC2014/003).