Harmonized soil biodiversity database to describe ecological status and soil health (MINOTAUR database)

Rajasekaran Murugan, Vivianne Judith Yayende-Guedoka, Christine Le Bas, Marion Mittmannsgruber, Alessia Fiore, Anita Maienza, Annamaria Bevivino, Antoine Schellenberger, Arianna Latini, Carlo Jacomini, et al.

HAL Id: hal-04660140

https://hal.inrae.fr/hal-04660140v1

Submitted on 23 Jul 2024

Harmonized soil biodiversity database to describe ecological status and soil health (MINOTAUR database)

Rajasekaran Murugan[1,2]*, Vivianne-Judith Yayende-Guedoka[3], Christine Le-Bas[3], Marion Mittmannsgruber[1,4], Alessia Fiore[5], Anita Maienza[6], Annamaria Bevivino[5], Antoine Schellenberger, Arianna Latini[5], Carlo Jacomini[7], Chiara Nobili[5], Christophe Geneste[3], Cristina Aponte[8], Elena Tondini[9], Erica Lumini[6], Filippo Sevi[5], Francesco Vitali[9], Gilberto Bragato[9], Giovanni L'Abate[9], Giuseppe Aprea[9], Guénola Pérès[10], Johann Zaller[4], Lorenzo d'Avino[9], Luciana Di Gregorio[5], Manuela Costanzo[9], Maria Fantappie[9], Maria Luisa Manici[9], Maria Viketoft[11], Mario Adam[3], Marjetka Suhadolc[12], Monique Smith[11], Sara Di Lonardo[6], Stefano Mocali[9], and Bispo Antonio[3]

[1] University of Natural Resources and Life Sciences, Institute of Soil Research, Vienna, Austria

[2] BIOS Science Austria, Vienna, Austria

[3] INRAE, Info&Sols, US 1106, Orléans, France

[4] University of Natural Resources and Life Sciences, Institute of Zoology, Vienna, Austria

[5] ENEA, Florence, Italy

[6] National Research Council, Institute of Bioeconomy, Sesto Fiorentino, Italy

[7] Italian Environmental Protection and Research Institute, Rome, Italy

[8] Spanish National Research Council, Forestry institute, Madrid, Spain

[9] Council for Agricultural Research and Economics, Florence, Italy

[10] UMR SAS, Institut Agro, INRAE, Rennes, France

[11] Swedish University of Agricultural Sciences, Uppsala, Sweden

[12] University of Ljubljana, Biotechnical Faculty, Ljubljana, Slovenija

Presenting author: rajasekaran.murugan@boku.ac.at

Existing differences in soil biodiversity data quality and geographic distribution seriously hamper effective use of available knowledge. The MINOTAUR project aims to optimize the data coupling, harmonization and analysis of soil biodiversity from various national and European data sources to support long-term harmonized European soil information and soil health monitoring. A standardized template for each data type was developed to collect soil biodiversity data. Soil biodiversity (macro fauna to microbes) data were collected 59 data sources (dataset, database, data warehouse) and 62 European projects. Collected biodiversity data along with meta-data were assessed and harmonized using standardized templates. The OpenADOM (Open source Application for Data Organization & Management), platform enables the creation of Information Systems (IS) quite rapidly and supports data sharing using FAIR principles. OpenADOM enables to describe the data model using a specific syntax with indentation to represent data structure and nesting. Data from different soil biological groups (macro, meso and micro fauna, bacteria and fungi) are linked to metadata (e.g. country, soil type, agricultural practices…). So far, macrofauna data were collected from over 9000 samples across 35 European countries. The use of OpenADOM platform allowed the rapid development of an IS for the MINOTAUR database, which otherwise would have been more time consuming considering the diverse set of data and meta-data types to be described and harmonized. The Minotaur database provides valuable information on harmonized soil biodiversity, supporting policy analysis and promoting soil biodiversity in global sustainability efforts.

Keywords: soil biodiversity, harmonization soil information systems, soil health, soil health monitoring, harmonized metadata.