

Personal profile

PhD Researcher with an academic background in sustainable environmental sciences and a growing focus on plant-soil-microbe interactions. Currently developing expertise in the synthesis and physicochemical characterization of waste-derived materials and their application in soil remediation processes. Interested in investigating soil microbial functions and biogeochemical processes through integrated experimental approaches.

Education

PhD in Environmental Life Sciences

University of Trieste, Italy – 2025–present

Effects of waste-derived nano-hydroxyapatite on soil microbial functions and biogeochemical processes in contaminated soils, with a strong emphasis on linking geochemical dynamics with microbial activity (enzymatic activities, nutrient cycling, and functional genes).

MSc in Sustainable Environmental Sciences and Technologies

University of Udine, Italy – 2023–2025

Final grade: 110/110 cum laude, with honors.

Thesis (in collaboration with University of Hohenheim): Phytotoxicity screening of European mine wastes using OECD germination and plant growth tests.

BSc in Environmental and Natural Sciences

University of Udine, Italy – 2020–2023

Final grade: 110/110 cum laude.

Thesis: *In vitro* meat vs. conventional livestock meat: an analysis of environmental impacts.

Research Experience

Visiting Research Period – CNR Nanotec, Lecce (April 2026)

Research visit focused on the preparation and preliminary characterization of bone-derived hydroxyapatite-based materials for environmental remediation applications. Activities included the synthesis of chicken- and bovine-derived bone char and nano-hydroxyapatite, physicochemical characterization by XRD, FTIR and SEM, and training in aqueous adsorption experiments for metal removal.

MSc Thesis & Research Internship – Erasmus+

University of Hohenheim, Institute of Landscape and Plant Ecology (Stuttgart, Germany) – Mar 2025 – Jun 2025

Research internship focused on plant responses to contaminated substrates under controlled laboratory and greenhouse conditions. The work included the design and implementation of OECD germination and plant growth tests, soil sample analysis, histological observations of plant tissues, and assessment of seedling growth, biomass production and leaf area. Plant physiological and morphological parameters were evaluated using SPAD chlorophyll measurements, LI-COR gas exchange analysis and leaf area analysis.

Scientific Contributions

Publications:

Pinto, O., Contin, M., Marchiol, L. (2026). An inferential ceiling in nanomaterial-assisted phytoremediation studies: Insights from a semi-systematic review of functional evidence in soil microbial communities. *Applied Soil Ecology*, 225, 107199. <https://doi.org/10.1016/j.apsoil.2026.107199>

Posters:

Phytotoxicity screening of European mine wastes using OECD germination and plant growth tests.
ICHMET 2025 – International Conference on Heavy Metals in the Environment, South Korea.

Abstracts:

Fitostabilizzazione di sedimenti minerari contaminati nel sito di Raibl (Cave del Predil, UD): effetto di ammendanti inorganici e organici su mobilità di Cd, Pb, Zn e risposta di specie vegetali autoctone.
SICON 2026 – Siti Contaminati – Workshop 2026

Technical and Language Skills

Software and data analysis: R, QGIS, Microsoft Office package.

Laboratory and instrumental skills: aqueous batch adsorption experiments, adsorption isotherm modelling, ICP-OES method setup and metal quantification, sample preparation for elemental analysis, plant growth tests under controlled conditions, greenhouse cultivation and monitoring, plant physiological measurements.

Languages: Italian, native; English, B2.

Additional Training

- Parma Green Week – workshops on sustainability and environmental challenges, Parma, Italy, 2024.
- Summer School in Agroecology and Social Inclusion – multidisciplinary training on sustainable agriculture, agroecology and social inclusion, Paluzza, Italy, 2023.