Mauro **Maver**

PostDoctoral Researcher

Bolzano I-39100, Italy

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Summary

Experienced Plant Scientist with over 5 years of postdoctoral research experience with a strong background in plant nutrition, physiology, allelopathy, rhizosphere biology, plant-microbe interactions, and soil chemistry. Specializes in molecular, genetic, and biochemical analysis of plant responses to environmental stressors, focusing on nutrient dynamics, secondary metabolites, and the impact of cultivation practices. Proficient in data analysis, experimental design, and scientific writing.

- Strong data analysis, statistical interpretation, and data visualization skills that ensure accurate and insightful research outcomes.
- Proficient in scientific writing, presenting research findings, and preparing publications and project evaluations.
- Effective educator with experience in developing and delivering course content in plant biochemistry, plant physiology, and soil science, along with mentoring students in thesis projects.
- Advanced knowledge of molecular biology, plant physiology, soil chemistry, and bioinformatics; strong coding skills in R and Python.
- Able to work effectively across diverse research environments and collaborate with interdisciplinary teams to achieve project goals.

Working Experience

PostDoctoral Researcher

Bolzano, Italy

Competence Center for Plant Health - Free University of Bozen-Bolzano Febraury 2021 - Febraury 2024

Research activities:

- Focus on understanding the processes within the rhizosphere influenced by soil-microorganism-plant interactions.
- Use molecular, genetic, chemical, and biochemical approaches to study how plants perceive environmental signals and how these signals alter plant physiology under biotic and abiotic stress.
- Characterize rhizospheric processes that affect nutrient dynamics, from soil mobilization to plant uptake, translocation, and nutrient allocation within the plant.
- Apply various methodologies to study the interactions and processes involved in nutrient dynamics.
- Evaluate the effects of different cultivation practices on the chemical, physical, and biological properties of the soil.

PostDoctoral Researcher

Bolzano, Italy

Faculty of Science and Technology - Free University of Bozen-Bolzano October 2019 - January 2021

Rhizosphere processes affect copper bioavailability in vineyard soils - RHIZOPRO Project.

- Evaluation of the qualitative and quantitative composition of root exudates from selected plants in response to varying levels of Cu under controlled conditions (hydroponic culture and soil conditions).

- Assessment of the microbial community in the rhizosphere and bulk soil of plants cultivated in Cu-contaminated soil (with a particular focus on grapevine plants).
- Characterization of the biochemical mechanisms triggered by Cu toxicity in plants.

Teaching Assistant

Bolzano, Italy

Faculty of Science and Technology - Free University of Bozen-Bolzano Febraury 2019 - February 2024

Bachelor and Master courses:

- Biochemistry and Physiology of Agricultural Plants - II semester, Bachelor in *Agricultural and Agro-environmental Sciences* - 2022-2023.
- Biochemistry and Physiology of Agricultural Plants - II semester, Bachelor in *Agricultural and Agro-environmental Sciences* - 2021-2022.
- Biochemistry and Physiology of Agricultural Plants - II semester, Bachelor in *Agricultural and Agro-environmental Sciences* - 2019-2020.
- Chemistry of fertilizers and mineral nutrition of grapevine - I semester, Master in *Viticulture, Enology and Wine Marketing* - 2019-2020.
- Mineral Nutrition - I semester, Master in "*Horticultural Science* - 2019-2020.
- Biochemistry and Physiology of Agricultural Plants - II semester, Bachelor in *Agricultural and Agro-environmental Sciences* - 2018-2019.

Mentoring

Bolzano, Italy

Faculty of Science and Technology - Free University of Bozen-Bolzano January 2018 - March 2023

Thesis Supervisor:

- Bachelor Thesis in Agriculture, Food, and Mountain Environment Sciences: "*The role of brassinosteroids in root architecture and adaptation in Arabidopsis thaliana in limiting phosphate conditions.*" - March 15th, 2023 by Asia Colmagro.
- Bachelor Thesis in Agricultural and Agro-environmental Sciences: "*Allelopathic effects on soil-plant-systems.* " - September 29th, 2020 by Sarah Fuchsbrugger.
- Bachelor Thesis in Agricultural and Agro-environmental Sciences: "*Study and characterization of the alkaloid hordenine in barley roots cv. Solist.*" - July 23rd, 2019 by Fabio Trevisan.

PostGraduate Researcher

Bolzano, Italy

Faculty of Science and Technology - Free University of Bozen-Bolzano July 2016 - October 2016

Research activities:

- The role of nutrient availability on fruit quality parameters: molecular and chemical evaluation of strawberry fruits.
- Strategies for sustainable vine nutrition aim to improve production and soil biodiversity.

Education

Ph.D. in Mountain Environment and Agriculture

Bolzano, Italy

Free University of Bozen-Bolzano November 2016 - November 2019

Thesis: Soil-plant-microorganism interactions involved in plant responses against biotic and abiotic stresses. *Supervisors: Prof. Tanja Mimmo, Prof. Stefano Cesco and Prof. Davide Bulgarelli.*

- Studied the distribution, accumulation, and root exudation of the alkaloids gramine and hordenine in wild relatives and modern barley cultivars.

- Identified wild barley genotypes with promising allelopathic traits for further investigation and potential reintroduction into modern cultivars.
- Conducted time-course and nutrient deficiency experiments to characterize hordenine production and its fate in agricultural soil.
- Evaluated the impact of gramine on the composition of the rhizosphere microbiota in modern barley varieties.
- Tested the hypothesis that secondary metabolites, such as gramine and hordenine, act as modulators of rhizosphere microbiota composition.

Ph.D. Visiting Researcher

Dundee, Scotland, UK

The James Hutton Institute & University of Dundee

June 2018 - March 2019

Supervisor: Prof. Davide Bulgarelli.

- Characterized the impact of gramine, a secondary metabolite of barley, on bacterial communities at the root-soil interface.
- Evaluated the effect of a specific barley genome locus on rhizosphere microbiota recruitment and maintenance, as well as yield traits.
- Led the entire experimental process, including research planning, nucleic acid manipulation, PCRs, Illumina sequencing, and statistical data analysis using R.

M.Sc. in Plant, Food and Agro-Environmental Biotechnology

Milano, Italy

University of Milano

October 2013 - November 2015

Master Thesis: Morpho-functional analysis of mitochondrial alteration induced by nutritional deficiencies in plants: characterization of ultrastructure, ionome and physiological parameters through live imaging analysis. *Supervisors: Prof. Graziano Zocchi and Prof. Gianpiero Vigani.*

B.Sc. in Plant, Food and Agro-Environmental Biotechnology

Milano, Italy

University of Milano

October 2010 - October 2013

Bachelor Thesis: Mitochondrial modification induced by Fe deficiency: biochemical and ultrastructural analyses by electron microscopy and tomography. *Supervisors: Prof. Graziano Zocchi and Prof. Gianpiero Vigani.*

Projects

Omnia Journal

mauromaver.eu/omnia

Editor-in-Chief, Editor

March 2024 - Present

Omnia is an independent, multidisciplinary, open-access journal dedicated to enhancing the communication of science-related topics.

- Open-access journal focused on describing and narrating science-related topics, currently emphasizing plant science.
- The journal features a Focus section that summarizes recent open-access scientific research into concise, accessible highlights, encouraging readers to explore the full original articles.

Skills

Laboratory & Research

- Experimental design - Lab techniques & organization - Plant Nutrition & Physiology - Plant Molecular Biology & Biochemistry - Soil Chemistry & Microbiology.

- Data & Statistical analysis - Data report & visualization - Scientific writing - Presentation skills - Research papers & Project evaluation.

Computer skills

- Windows, Linux, and MacOS operating systems - Microsoft Office Suite (Word, Excel, Powerpoint, and Teams) - Adobe Creative Suite (Acrobat Reader, Illustrator, and InDesign) - Waters Empower software.
- RStudio - Quarto - Coding languages (R, Python and HTML/CSS) - Bioinformatic tools - GitHub.

Language Skills

- **English**: Full proficiency
- **Italian**: Native
- **Spanish**: Basic
- **Irish**: Basic

Publications

Peer-reviewed

[1] Bouaicha O, **Maver M**, Mimmo T, Cesco S & Borruso L. (2024). Microplastic influences the ménage à trois among the plant, a fungal pathogen, and a plant growth-promoting fungal species. *Ecotoxicology and Environmental Safety*. DOI: 10.1016/j.ecoenv.2024.116518.

[2] Allarà C, Ciocca M, **Maver M**, Mimmo T & Petti L. (2023). A Novel Automatic Method for Primary Roots Length Measurements in Arabidopsis thaliana. *IEEE International Workshop on Metrology for Agriculture and Forestry (MetroAgriFor)*. DOI: 10.1109/MetroAgriFor58484.2023.10424201.

[3] **Maver M**, Trevisan F, Miras-Moreno B, Lucini L, Trevisan M, Cesco S & Mimmo T. (2022). The interplay between nitrogenated allelochemicals, mineral nutrition and metabolic profile in barley roots. *Plant and Soil*. DOI: 10.1007/s11104-022-05553-8.

[4] Escudero-Martinez C, Coulter M, Terrazas RA, Foito A, Kapadia R, Pietrangelo L, **Maver M**, Sharma R, Aprile A, Morris J, Hedley PE, Maurer A, Pillen K, Naclerio G, Mimmo T, Barton GJ, Waugh R, Abbott J & Bulgarelli D. (2022). Identifying plant genes shaping microbiota composition in the barley rhizosphere. *Nature Communications*. DOI: 10.1038/s41467-022-31022-y.

[5] Bouaicha O, Tiziani R, **Maver M**, Lucini L, Miras-Moreno B, Zhang L, Trevisan M, Cesco S, Borruso L & Mimmo T. (2022). Plant species-specific impact of polyethylene microspheres on seedling growth and the metabolome. *Science of the Total Environment*. DOI: 10.1016/j.scitotenv.2022.156678.

[6] **Maver M**, Escudero-Martinez C, Abbott J, Morris J, Hedley PE, Mimmo T & Bulgarelli D. (2021). Applications of the indole-alkaloid gramine modulate the assembly of individual members of the barley rhizosphere microbiota. *Peerj*. DOI: 10.7717/peerj.12498.

[7] Kolega S, Miras-Moreno B, Buffagni V, Lucini L, Valentinuzzi F, **Maver M**, Mimmo T, Trevisan M, Pii Y & Cesco S. (2020). Nutraceutical Profiles of Two Hydroponically Grown Sweet Basil Cultivars as Affected by the Composition of the Nutrient Solution and the Inoculation With Azospirillum brasilense. *Frontiers in Plant Science*. DOI: 10.3389/fpls.2020.596000.

[8] **Maver M**, Miras-Moreno B, Lucini L, Trevisan M, Pii Y, Cesco S & Mimmo T. (2020). New insights in the allelopathic traits of different barley genotypes: Middle Eastern and Tibetan wild-relative accessions vs. cultivated modern barley. *PloS One*. DOI: 10.1371/journal.pone.0231976.

[9] Marastoni L, Pii Y, **Maver M**, Valentinuzzi F, Cesco S & Mimmo T. (2019). Role of Azospirillum brasilense in triggering different Fe chelate reductase enzymes in cucumber plants subjected to both nutrient deficiency and toxicity. *Plant Physiology and Biochemistry*. DOI: 10.1016/j.plaphy.2019.01.013.

[10] Vigani G, Pii Y, Celletti S, **Maver M**, Mimmo T, Cesco S & Astolfi S. (2018). Mitochondria dysfunctions under Fe and S deficiency: is citric acid involved in the regulation of adaptive responses?. *Plant Physiology and Biochemistry*. DOI: 10.1016/j.plaphy.2018.02.022.

[11] Valentinuzzi F, **Maver M**, Fontanari S, Mott D, Savini G, Tiziani R, Pii Y, Mimmo T & Cesco S. (2018). Foliar application of potassium-based fertilizer improves strawberry fruit quality. *Acta Horticulturae*. DOI: 10.17660/ActaHortic.2018.1217.48.

[12] Vigani G, Faoro F, Ferretti AM, Cantele F, Maffi D, Marelli M, **Maver M**, Murgia I & Zocchi G. (2015). Three-dimensional reconstruction by TEM tomography of the ultrastructural modifications occurring in Cucumis sativus L. mitochondria under Fe deficiency. *PloS One*. DOI: 10.1371/journal.pone.0129141.

Books

[1] Masia V, Bréartúin CÓ & **Maver M**. (2024). L'irlandese contemporaneo. Storia, cultura, struttura e identità. *Tab Edizioni*. ISBN 978-8892958685.

Scientific writing

[1] **Maver M**. (2024). Floral synchrony: the role of FLOWERING LOCUS T in the leaf-specific vernalisation response in Arabidopsis. *Omnia Focus*. DOI: 10.5281/zenodo.10955449.

[2] **Maver M**. (2024). ^{13}C dynamics in forest rhizosphere microbial communities under drought and rewetting. *Omnia Focus*. DOI: 10.5281/zenodo.11148076.

[3] **Maver M**. (2024). Enhanced photosynthesis in rice with far-red light supplement: unveiling dual roles beyond shade avoidance. *Omnia Focus*. DOI: 10.5281/zenodo.11216924.

[4] **Maver M**. (2024). Enhancing root-knot nematode invasion resistance in clover through root uptake of benzoxazinoids. *Omnia Focus*. DOI: 10.5281/zenodo.11491221.

[5] **Maver M**. (2024). Modulation of lettuce responses to salinity by Graminaceae-derived protein hydrolysates. *Omnia Focus*. DOI: 10.5281/zenodo.11965373.

[6] **Maver M**. (2024). Plant-mediated soil effects on microbiota in plant-herbivore systems. *Omnia Focus*. DOI: 10.5281/zenodo.12188671.

[7] **Maver M**. (2024). TWA1: a novel thermosensor enhancing plant thermotolerance. *Omnia Focus*. DOI: 10.5281/zenodo.12582848.

[8] **Maver M**. (2024). Repressive role of GLK in vindoline and TIA pathway regulation in Catharanthus roseus. *Omnia Focus*. DOI: 10.5281/zenodo.12608361.

[9] **Maver M**. (2024). Role of ExAD in salt-induced directional root response in Arabidopsis thaliana. *Omnia Focus*. DOI: 10.5281/zenodo.12633958.

[10] **Maver M**. (2024). Impact of intraspecific chemodiversity on growth and reproduction in Tanacetum vulgare. *Omnia Focus*. DOI: 10.5281/zenodo.12723623.

[11] **Maver M**. (2024). Independent effects of drought and cultivation systems on wheat: insights from the trait space concept. *Omnia Focus*. DOI: 10.5281/zenodo.12732498.