University Academic Curriculum Vitae

Personal information

Name: **Oussama Bouaicha**

Place of birth:

Date of birth:

Nationality:

Address:

Mobile:

E-Mail:

Education

- **2019- 2023**
  Title: Ph.D. student in Mountain Environment and Agriculture.
  Institution: Free University of Bolzano/Bozen (Italy).
  Responsibilities: Fate and effects of plastic materials in soils and their impact on crop plants, soil microbial diversity, and soil animal in agroecosystems.

- **2019**
  Master of science (level II) in Sustainable IPM Technologies for Mediterranean Fruit and Vegetable Crops.
  The Mediterranean Agronomic Institute of Bari, (Italy).

- **2018**
  Master University I level in Sustainable IPM Technologies for Mediterranean Fruit and Vegetable Crops.
  The Mediterranean Agronomic Institute of Bari and the School of Management and LUM Jaen Monnet University, Bari (Italy).

- **2014-2016**
  Master's Degree in Agronomy.
  Ecole Nationale Supérieure d'Agronomie* EL Harrach*, Algeries (Algeria).

- **2011-2016**
  Engineer degree in Plant protection.
  Ecole Nationale Supérieure d'Agronomie. * EL Harrach*, Algeries (Algeria).

Present appointment

- **Mars 2025- Mars 2026**
  Title: Research assistant.
  Institution: Free University of Bolzano/Bozen (Italy).
  Title of the project: Managing the project *Next Generation Biomonitoring Vineyard Soils to Support Sustainable Agroecosystems* (BioViSo).

Additional courses

- **2022**
  Metabarcoding in Microbial Ecology.
  30 hours (6-10 July).

Physalia Courses, Berlin (Germany).

- **2018**
  Developing phytosanitary capacity.
  60 hours (28 May-08 June).
  IPPC-FAO/CIHEAM Bari (Italy).

- **2018**
  Competence in Training and Facilitation Skills.
  30 hours (26 Feb-02 Mars).
  Knowledge & Skills, training consultants, Bari (Italy).

- **2014**
  Training in plant pathogens isolation, characterization, and identification.
  60 hours (21 Dec-31 Dec).
  Regional plant protection station, Constantine (Algeria).

Professional experience

- **Mars2023-Mars 2025**
  Job title: research assistant.
  Institution: Free university of Bolzano, (Italy).
  Academic level: Master's degree.
  Responsibilities: Managing the project Next generation biomonitoring vineyard soils to Support Sustainable Agroecosystems (BioViSo).

- **November 2019-July2023**
  Job title: PhD student.
  Institution: Free university of Bolzano, (Italy).
  Academic level: Master's degree.
  Responsibilities: Fate and effects of plastic materials in soils and their impact on crop plants, soil microbial diversity, and soil animal in agroecosystems.

- **May 2022-October 2022**
  Job title: Visitant scientist.
  Institution: University of Castilla - La Mancha, Toledo, (Spain).
  Academic level: Master's degree.
  Responsibilities: Evaluation of the possible impacts of microplastic (PS) on *Tenebrio molitor* Larva, and soil biomarkers.

- **November 2018 –October 2019**
  Job title: Master of science.
  Institution: The Mediterranean Agronomic Institute of Bari, (Italy).
  Academic level: Master level I.
  Responsibilities: Modeling of insect vector of *xyllela fastidiosa* in Apulia region (Italy).

- **October 2017 – July 2018**

Job title: Master level I
Institution: The Mediterranean Agronomic Institute of Bari, (Italy).
Academic level: Specialist Degree.
Responsibilities: Sustainable IPM Technologies for Mediterranean Fruit and Vegetable Crops Case study: grapevine open field Apulia region.

- **September 2016 – September 2017**
  Job title: Technical Assistant.
  Institution: TIMAC AGRO Algeria SARL, Alger (Algeria).
  Academic level: Master's Degree.
  Responsibilities: Identification and solving problems related to diseases associated at different cultures, especially: Solanaceae (tomato, potato), Cucurbitaceae (melon and watermelon), Fruit trees and cereals; Preparation of fertilization calendar according to soil analyses and crop state.

- **January 2016 – July 2016**
  Job title: Master's degree.
  Institution: Ecole Nationale Supérieure d'Agronomie. Algeries (Algeria).
  Academic level: Engineer's degree.
  Responsibilities: Cultural and pathological characterization of *Microdochium nivale* (Fr.) Samuels& Hallet and *Microdochium majus* (Wollenw.) Glynn & S.G. Edwards agents of wheat root rot.

- **September 2015 – July 2016**
  Job title: Engineer degree.
  Institution: Ecole Nationale Supérieure d'Agronomie. Algeries (Algeria).
  Academic level: BAC+5.
  Responsibilities: Morphological, cultural and molecular identification of *Microdochium nivale* (Fr.) Samuels & Hallet and *Microdochium majus* (Wollenw.) Glynn & S.G. Edwards agents of Wheat root rot.

Experience in academic teaching

Academic year 2024/25

- Teaching assistant for the course "**Elements of Chemistry and Biochemistry Applied to Food and Wine Sciences (L-GASTR)**", Free University of Bolzano. Teaching language: English. (12 hours).

Academic year 2022/23

- Professor for the course "**Elements of Chemistry and Biochemistry Applied to Food and Wine Sciences (L-GASTR)**", Free University of Bolzano. Teaching language: English. (30 hours).

Academic year 2022/23

- Teaching assistant for the course "**Soil Ecology" (LM-73)**", Free University of Bolzano. Teaching language: English. (10 hours).

Academic year 2021/22

- Teaching assistant for the course "**Soil Ecology" (LM-73)**", Free University of Bolzano. Teaching language: English. (10 hours).

Academic year 2020/21

- Teaching assistant for the course of "**Soil Quality and Soil Fertility" (LM-73)**", Free University of Bolzano. Teaching language: English. (20 hours).

Laboratory co-supervision

- **M.Sc. students**

1) At the Free University of Bolzano: Nicholas Rapagnani (Eco-Social Design, 2021 - 2022).
2) At the University of Innsbruck: Adina Schmid (Environmental Management of Mountain Area - EMMA, 2021-2022).

- **Bachelor students**

3) At the Free University of Bolzano: Samual Basso (Bachelor in Agricultural, Food, and Mountain Environmental Sciences)

- **Ph.D. students**

4) At the Free University of Bolzano: Sahra Riviere (Ph.D in Mountain Environment and Agriculture)
5) At the Free University of Bolzano: Camilla Febo (Ph.D Food Engineering and Biotechnology)

Others

Research assistant: At the Free University of Bolzano: Nicholas Rapagnani (Eco-Social Design department, 2023 - 2024).

Research and scholarships

- **November 2019 – January 2023**
  Award Holder(s): Oussama Bouaicha.
  Funding Body: Free University of Bolzano.
  Title: PhD scholarship.

- **May 2022 – October 2022**
  Award Holder(s): Oussama Bouaicha.
  Funding Body: Free University of Bolzano.
  Title: Visiting Doctoral Fellowship at the University of Castilla-la Mancha

- **November 2018 – October 2019**
  Award Holder(s): Oussama Bouaicha.
  Funding Body: The Mediterranean Agronomic Institute of Bari, (Italy).
  Title: Master of Science.

- **October 2017 – June 2018**
  Award Holder(s): Oussama Bouaicha.
  Funding Body: The Mediterranean Agronomic Institute of Bari, (Italy).
  Title: Master level I.

Technical skills

- **Molecular biology and microbial ecology skills**

Microbiology: Culture media preparation; Isolation, purification, characterization, and identification of bacteria and fungi; optical microscopy; staining; preparation of inoculums.
DNA extraction: Bacterial and fungal DNA extraction and purification from soil, culture media, vegetable tissue; DNA quantification.
Microorganisms quantification: RT-PCR.

- **Environmental ecology and soil chemistry skills**
  soil characterization: pH and electric conductivity, texture determination, available nutrient content; biomass compositional analysis (nitrogen, ammonia, phosphorus, phosphate); **elemental analysis** of soil and plant tissues (extraction and quantification); **metabolomic profiling** of plant tissues (GC-MS and LC-MS); **Enzymatic and biomarkers analysis** of soils, plants, and animal tissues (Protein content, Urease, Carboxylesterase, Phosphatase, Glucosidase, Dehydrogenase, Total organic carbon and nitrogen, Dissolvent organic carbon, and Soil respiration, Glutathione transferase and reductase); **Soil pesticide analysis** (LC-MS, GC/MS), High-Performance Liquid Chromatography (HPLC)); **Fungal metabolism** (Fungal exudate extraction, separation, and quantification).

- **Field activities and sampling skills**
  Experience in sampling from different environmental matrices, soil, rhizosphere, vegetable tissue, and insects.
  Sampling campaign:
  1. 2016 East and Central Algeria (In the field: Cereal root, crown, head, and rhizosphere soil).
  2. 2021 Conegliano- Treviso, Italy (Vineyard: soil and grape leaves and roots).
  3. 2019 Taranto- Apulia region, Italy (Olive branches, insect larva and adult).
  4. 2017 ENSA, Algeria (*In Situ* plants pots, wheat roots, and rhizosphere).
  5. 2017 ENSA, Algeria (herbaceous seed stock sampling in soil).
  6. 2023 Sud Tyrol-Italy (soil samples from 42 vineyards distributed all over Sud Tyrol with 1008 samples divided into two periods, 42 vineyards, and 12 replicates. For each replicate, I have sampled three separate sub-samples dedicated to microbial and metazoan diversity and abundance “DNA extraction”, Soil chemical and agrochemicals analysis, and enzymatic analysis).
  7. 2023-2024 Sud Tyrol-Italy, Apple orchard soil sampling for microbial, enzymatic, and chemical analysis, both from the upper soil layer (<30cm) and deep soil sample (>60cm)
  8. 2024 Sud Tyrol-Italy, sampling soil for Bulk density and carbon cycling analysis (in collaboration with EURAC) from mountains meadow between Trentino and north Sud Tyrol.

- **Graphic design skills**
  Fundamental skills in **Photoshop CS6**, **Illustrator**, and **Inkscape.**

Statistic skills

- **Univariate** and **multivariate** statistics on microbial communities, metabolome, and iomic data.
- **multivariate** analysis and feature selection of **omics data (PLS, OPLS-DA)**
- analyzing large datasets containing a high number of dimensions/features per observation and enabling the visualization of multidimensional data (e.g., **PCA, PCoA, NMDS**).
- Good command of statistical software (**SPSS, Statistica, R-studio**).

Informatic and bioinformatic skills

- **Windows** and medium **Linux** language**.**
- Bioinformatics analysis of next-generation sequencers outputs using ad-hoc pipelines **Qiime2** and the use of databases (**SILVA and BLAST**).
- **Microbial diversity** (alpha and beta) **and abundance** using both **Qiime2** and **R-studio.**

Languages

- **Arabic**: First Language
- **English**: (C1; computer-based exams, Oral, and writing; UNIBZ 2021)
- **French**: (B2; TCF-SO)
- **Italian**: (B1; computer-based exams, Oral, and writing; UNIBZ 2023)

Publications

List of publications on scientific journals

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. Ecotoxicol. Environ. Saf. 279, 116518. https://doi.org/10.1016/j.ecoenv.2024.116518
2) Rapagnani, N., van Bezooijen, A., Borruso, L., Mimmo, T., & **Bouaicha, O.** (2024). Bio Design for Footwear Innovation: Growing Sneaker Components with Composite Mycelium-based Materials. Cambridge Open Engage. doi:10.33774/coe-2024-5cc7n.
3) **Bouaicha, O**., Laraba, I., Boureghda, H., (2022). Identification, in vitro growth and pathogenicity of Microdochium spp. associated with wheat crown rot in Algeria. J. Plant Pathol. https://doi.org/10.1007/s42161-022-01214-y (IF 2.643).
4) **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. Sci. Total Environ. 840, 156678. https://doi.org/10.1016/j.scitotenv.2022.156678(IF 10,753).

5) **Bouaicha, O**., Mimmo, T., Tiziani, R., Praeg, N., Polidori, C., Lucini, L., Vigani, G., Terzano, R., Sanchez-Hernandez, J.C., Illmer, P., Cesco, S., Borruso, L., (2022). Microplastics make their way into the soil and rhizosphere: A review of the ecological consequences. Rhizosphere 22, 100542. https://doi.org/10.1016/j.rhisph.2022.100542 (IF 3.437).

6) Laraba I., Boureghda H., Abdallah N., **Bouaicha O**., Obanor F., Moretti A., Geiser D. M., Kim H.-S., McCormick S. P. and Proctor R. H. (2017). Population genetic structure and mycotoxin potential of the wheat crown rot and head blight pathogen fusarium culmoruminAlgeria.Fungalgeneticsand biology, 103: 34-41. http://doi.Org/10.1016/j.fgb.2017.04.001 (IF 3.476).

Conference abstracts and posters

1) Corbetta M, Sweidan Z, **Bouaicha O**, Gualano S, Baser N, Santoro F, Rossi V. (2024). Adaptation of a physiologically based model for predicting the phenology of Philaenus spumarius: first validation in Italian olive groves. Lispao,Portugal 2024

2) **Bouaicha O.**, Praeg N., Schönafinger A., Niedrist G., Mimmo T., Illmer I., Borruso L. (2024). Next Generation Biomonitoring Vineyard Soils to Support Sustainable Agroecosystems. Centennial Celebration and Congress of the International Union of Soil Sciences.Florence, Italy *19-21 May 2024*.

3) **Bouaicha O.,** Trevisan F., Tiziani R., Brenner M., Weckwerth W., Lucini L., Cesco S., Mimmo T., Borruso L. (2022). The effect of microplastic foliar exposure on rhizosphere ecology in tomato plants (*Solanum lycopersicum* L.). III Convegno AISSA under40. *Bolzano, Italy 14-15 July 2022.*

4) **Bouaicha O**., Tiziani R., Maver M., Lucini L., Begona M., Trevisan M., Cesco S., Borruso L., Mimmo T. Impacts of microplastic on the growth and metabolism of mono- and dicot seed and seedlings. Agricultural Chemistry Winter School (ACWS2022). *Online-Udine 14-17 February 2022*.

5) **Bouaicha O**., Tiziani R., Lucini L., Begona M., Trevisan M., Cesco S., Borruso L., Mimmo T. (2021) Impact of micro-polyethylene on seed germination of mono- and dicot plants. Second Joint Meeting on Soil and Plant System Sciences (SPSS 2021). *Online - Torino 20-23 September 2021.*

6) **Bouaicha O.,** Tiziani R., Lucini L., Begona M., Trevisan M., Cesco S., Borruso L.1, Mimmo T. (2021). Impacts of plastic materials on plant growth. Agricultural Chemistry Winter School (ACWS2021). *Online-Torino 8-11 February 2021*.

7) **Bouaicha O.** (2020) The dynamic population in Italy (Taranto province, South Italy) of *Philaenus spumarius* (L.) and *Neophilaenus campestris* (Fallén.): principal vectors of Xylella fastidiosa. Informations et ressources scientifiques sur le développement des zones arides et semi-arides. Istituto Agronomico Mediterraneo di Bari (IAMB), *Bari, Italy 14 May 2020.*

8) Boureghda H., Abdallah N., Laraba I., **Bouaicha O**., Belhadj-Ben yahia F. Identification of fungal species associated with crown rot and fusarium head blight of wheat in Algeria and biological control by *Trichoderma atroveride*. 12th Arab Congress of Plant Protection *Hurghada, Egypt 4-10 November 2017.*

9) Laraba I., Boureghda H., Abdallah N., **Bouaicha O**., Obanor F., Moretti A., Geiser D. M., Kim H.-S., McCormick S. P. and Proctor R. H. (2017). Population genetic structure and mycotoxin potential of the wheat crown rot and head blight pathogen *Fusarium culmorum* in Algeria, Italy, Australia and the United States.29th Fungal Genetics Conference. Asilomar Conference Center Pacific Grove,CA,*USA 14-19 March 2017.*

Oral Presentations at scientific conferences

Impact of microplastics aerial deposition on rhizosphere soil ecology: the case study of tomato (Solanum lycopersicum L.) exposed to polyethylene. Plastic pollution from macro to nano (MICRO2022). CCSD-Online 14-18 November 2022. https://micro2022.sciencesconf.org

Impact of polyethylene microplastics aerial deposition on the rhizosphere soil ecology of tomato (Solanum lycopersicum L.). XIII International Agriculture Symposium "AGROSYM 2022". Jahorina mountain- Sarajevo (Bosnia and Herzegovina) 6-9 October 2022. http://agrosym.ues.rs.ba/

Aerial deposition of polyethylene microplastics affects tomato (Solanum lycopersicum L.) rhizosphere soil ecology. Global Symposium on Soils for Nutrition (GSOIL4N). FAO-Online 26-29 July 2022. https://www.fao.org/events/detail/symposium-soils-for-nutrition/en

Statement of interest

My scientific formation and research interests of Mr. Oussama Bouaicha are mainly focused on the interactions between plants (crops and trees) and the environment (i.e., biotic and abiotic factors) to obtain promising ways to boost environmental sustainability by decreasing the impact of imbalanced nutrient availability and ecotoxicity of xenobiotic compounds. Furthermore, my research interests focus activities related to ensure better management of plant diseases and pests (microorganisms, and fauna) in agroecosystems.

For this purpose, I have applied multidisciplinary approaches combining different areas such as microbiology (e.g., isolation, growing, and characterization of bacterial and fungi), molecular biology (e.g., DNA and RNA extraction and purification, electrophoresis, PCR, RT-qPCR), biochemistry (soil, plant tissues, and animal tissues enzymatic methods), plant physiology and morphology, analytical methodologies, as well as metabolomic and elemental studies.

In details, the research activity of Mr. Oussama Bouaicha has been focused on:

- Evaluation of the interaction plant-microorganism-fauna-environment.
- Rhizosphere interactions.
- Metabolic profiling of plant tissues.
- Mineral profiling of plants and soil to evaluate the status of elements in the agroecosystems.
- Enzymatic activity, chemical analysis, and biomarkers in soil and living tissues
- Soil pesticides analysis
- functional diversity of rhizosphere microbial communities in response to biotic and abiotic stresses.
- Risk assessment of xenobiotics (e.g., pesticides) in soil, microorganisms, and animal tissues based on the evaluation of essential enzymes and biomarkers.
- Isolation, screening, and biochemical and molecular characterization of plant pathogens.
- Interaction between plants and phytopathogens.
- Modeling of insect populations, including spy insect vectors of phytopathogens.
- Field sampling of different environmental matrices; soil, rhizosphere, crops, trees, insect (color traps, hormone traps, sweep net).
- Ecological studies and diversity.

The undersigned, Oussama Bouaicha, C.F. BCHSSM92M17Z301W, born in Constantine (Algeria), on August 17th, 1992, gives his consent to his personal data being processed, within the limits of the legislative decree 196/2003, for formalities connected with the present procedure.

Date

Bolzano, 15/03/2025 Signature