Sharda Bharti (Ph.D.)

Research Scientist | Plant Pathology | Structural Biology | Molecular Biology | Organic Chemistry

PROFESSIONAL PROFILE

Postdoc fellow with a Ph.D. in Mountain Environment and Agriculture from the Free University of Bozen-Bolzano (UNIBZ), Italy, with doctoral research focused on structural biology, with research focused on structural and functional characterization of proteins involved in siderophore-mediated iron uptake in the plant pathogen Erwinia amylovora. Two years of subsequent research experience in plant pathology and agricultural research through the Project named "Hyperspectral imaging for the detection of physiologically and parasitically induced damages on apple fruit at harvest and during postharvest"

Interdisciplinary expertise spanning plant pathology, structural biology, protein biochemistry, molecular biology, microbiology, organic chemistry, and agricultural sciences. Experienced in postharvest fungal diseases of apple fruit, protein expression and purification, biophysical characterization, molecular methods, and the generation of experimental datasets for optical and hyperspectral disease detection.

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher / Research Assistant - HIPPA Project

Free University of Bozen-Bolzano (UNIBZ), Italy | June 2024 - June 2026

- Conducted research on postharvest fungal diseases of apple fruit, including cultivation and characterization of economically important fungal pathogens.
- Planned and performed controlled fruit inoculation, incubation, disease assessment, and phenotyping experiments.
- Generated well-characterized biological samples and datasets for RGB, spectral, and hyperspectral imaging aimed at early disease detection and classification.
- Contributed to molecular identification and characterization of plant-pathogenic fungi.
- Collaborated with multidisciplinary teams in plant pathology, optical sensing, hyperspectral imaging, and data analysis.
- Contributed to data interpretation, scientific reports, presentations, manuscripts, and dissemination of project results.

EDUCATION

PhD in Mountain Environment and Agriculture

Free University of Bozen-Bolzano (UNIBZ), Italy | November 2020 - February 2024

Major/Research Area: Organic Chemistry / Structural Biology

Thesis: *Structural and Functional Characterization of Proteins Involved in Siderophore-Mediated Iron Uptake in Erwinia amylovora*

- Investigated proteins involved in siderophore-mediated iron acquisition in the plant-pathogenic bacterium *Erwinia amylovora.*
- Performed recombinant protein expression, purification, biochemical and biophysical characterization.
- Applied protein crystallization, X-ray diffraction, and structural analysis.
- Used DSF, DLS, CD, SEC-MALS, and SAXS for complementary protein characterization.

Erasmus Mundus Joint Master's Degree - Plant Health in Sustainable Cropping Systems

University of Padova, Italy and University of Göttingen, Germany | 2017 - 2019 | **110/110 cum laude**

Master's Thesis: *Effects of Natural Phenolic Compounds on Fumonisin Production and fum Gene Expression in the Maize Pathogen Fusarium verticillioides*

B.Sc. Agriculture

Rajendra Agricultural University, Pusa, Bihar, India | 2012 - 2015 | **CGPA 8.086/10, First Class with Distinction**

PEER-REVIEWED PUBLICATIONS

- **Bharti S,** Carlini L, Esposito A, Benini S (2025). Bioinformatics and modelling studies of FhuD, the periplasmic siderophore binding protein from the plant pathogen Erwinia amylovora. PLoS One 20(7): e0326667. DOI: 10.1371/journal.pone.0326667.
- Carlini L, Esposito A, Ambrosino L, **Bharti S**, Mauro L, Invernizzi S (2023). The Ams Proteins and the Amylovoran Biosynthetic Pathway: An Extensive Bioinformatic Study. Journal of Plant Pathology. DOI: 10.1007/s42161-023-01532-9.
- Ferrigo D, **Bharti S,** Mondin M, Raiola A (2021). Effect of Naturally Occurring Compounds on Fumonisin Production and fum Gene Expression in Fusarium verticillioides. Agronomy. DOI: 10.3390/agronomy11061060.

CONFERENCE PAPER / PUBLISHED PROCEEDINGS

- Scuri G, **Bharti S**, Rasinariu I, Sadar N, Baric S, Zanella A, Mejia-Aguilar A (2025). Toward an automated optical system to detect diseases and post-harvesting disorders in apple fruits. Proceedings of SEIA'25, pp. 70-73.

SELECTED SCIENTIFIC CONFERENCES & PRESENTATIONS

- **Bharti S**, Qayyum H, Baric S. A noninvasive approach to targeted lenticel and core inoculation of apple fruit with fungal phytopathogens. International Congress of the Mediterranean Phytopathological Union, Bari, Italy, 6-10 July 2025. Oral presentation.

- **Bharti S**, Qayyum H, Scuri G, Aguilar AM, Zanker M, Baric S. Differentiation and early detection of post-harvest apple pathogens using hyperspectral imaging. 14th Conference of the European Foundation for Plant Pathology, Uppsala, Sweden, 2-5 June 2025. Poster.
- **Bharti S,** Polsinelli I, Bento I, Schneider T, Baric S, Benini S. Structural characterization of ViuB, a siderophore-interacting protein of Erwinia amylovora. XXIX Conference of the Italian Society of Plant Pathology (SIPaV), Trento, Italy, 9-11 September 2024. Oral presentation.
- Qayyum H, **Bharti S**, Baric S. Optimizing the protocol for precise inoculation of single lenticel of apple fruit. XXIX SIPaV Conference, Trento, Italy, 9-11 September 2024. Poster.
- Scuri G, **Bharti S**, Rasinariu I, Sadar N, Baric S, Zanella A, Mejia-Aguilar A. Toward an automated optical system to detect diseases and post-harvesting disorders in apple fruits. 11th International Conference on Sensors and Electronic Instrumentation Advances, Ponta Delgada, Portugal, 24-26 September 2025. Oral presentation by G. Scuri.

RESEARCH SCHOLARSHIPS & AWARDS

- **2016 - Erasmus EU-India Consortium BRAVE:** Undergraduate visiting student at the University of Helsinki, Finland; training in plant virology and breeding for resistance. *Funding: €6,000.*
- **2017 - Erasmus+ Programme of the European Union:** Fellowship for Erasmus Mundus Master's degree. *Funding: €49,000.*
- **2023 - MOSBRI - European Union Horizon 2020 (Grant Agreement No. 101004806):** Visit grant for Molecular-Scale Biophysics Research Infrastructure at BIOCEV, Prague. *Funding: €760.*
- **2023 - Instruct-ERIC:** Fellowship for research internship at EMBL Hamburg. *Funding: €4,000.*