RENATO CARVALHO Ph.D.

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EDUCATION

Ph.D. Plant Pathology April 2022
Plant Pathology Department - University of Florida
Advisors: Dr. Mathews L. Paret and Dr. Jeffrey B. Jones
Gainesville – FL

M.B.A. December 2016
IAC – Agronomic Institute of Campinas
Campinas – Brazil

January 2015

M.Sc. Technological Chemistry
Chemistry Department – Federal University of São Carlos
Advisor: Dr. Edenir Rodrigues Pereira Filho
São Carlos - Brazil

B.Sc. Chemistry December 2010

PROFESSIONAL EXPERIENCE

Cornell University
Postdoctoral Associate – Ithaca NY
Identification of fungicide mode of action using high throughput genomics. Application of massively parallel screens and transcriptional profiling to identify the genetic mechanisms involved in responding to fungicides.

University of Florida
Graduate Research Assistant – Gainesville FL

Development of a novel nano-based chemical to control bacterial spot of tomato and pepper understanding its mode of action and target sites in *Xanthomonas* spp.

- Proof of the efficacy of the nanoparticles to inhibit bacteria and control bacterial spot by designing and performing *in vitro* assays, and plant inoculations, disease evaluations in greenhouse, and field experiments.
- Proof of structural damage caused under chemical exposure by designing and performing epifluorescence microscopy, modified qPCR using amplification inhibitors, Raman spectroscopy, and scanning electron microscopy.
- Proof of the multisite targets of chemical on bacterial cells by analyzing the transcriptomics using RNA sequencing and bioinformatic tools to understand the biological pathways of cells exposed to chemicals.

Formulation of new insecticide with repellent and protective action using clay particles based on aluminum silicates to disturb whitefly visual perception of the plant and consequently reduce viral transmission.

- Proof of efficacy of 6 different clays to reduce whitefly in tomato, watermelon, and squash by formulating the applications (enhancing clay minerals with thixotropies,

and stickers) in field conditions and evaluating the insect population and disease incidence (*Tomato yellow leaf curl virus* and *Cucurbit leaf crumple virus*)

Characterization of three new phytobacteria into the *Pseudomonas* group by using whole-genome sequencing, phenotypic, and phylogenetic approaches.

Monsanto Jun 2011 – Aug 2017

Research Associate – Petrolina PE – Brazil

- Clearance of exotic pests in worldwide foreign samples to ensure biological safety prior to entrance in the country by performing visual, molecular, serologic, and greenhouse assays targeting fungi, nematodes, bacteria, and viruses in cotton, corn, soybeans, and sorghum.
- Guarantee of high precise analytical process and documents trackability for all quarantine processes and collaborators being responsible for implementing a Quality system management based on ISO 17025.
- Lead for the Sustainability project to include the station collaborators (>300) in the conscientization/training of good practices and continuous improvements in the farm operations (laboratories, IPM, irrigation, and land operations) to reduce the carbon footprint and correct management and destination of residuals.

Laboratory Coordinator – Conchal SP – Brazil

- Acceleration of the analytical process in sugarcane up to 300% being responsible for the implementation of a novel near-infra-red (NIR) technology to analyze fibered samples of sugarcane. Technique innovative for fibered sugarcane included large databank acquirement and management, chemometrics analysis to calibration/feedback calibration, and design of analytical routine.
- Coordination of 3 labs in different regions in Brazil where the NIR technology was applied. Coordination included people management (full-time and seasonal), training, process standardization, quality control, and budget management.
- Increase and conscientize the safety culture in the sugarcane station working as the focal point for HSE. Responsibilities included safety training for third part contractors and monthly seminars to ensure continuous improvement. Moreover, lead the sustainable project in the station to reduce the laboratories residues and correct destination to save resources and ensure a green process for the sugarcane breeding stations.

PUBLICATIONS

- **Carvalho, R**., Jones, J.B., Paret, M.L. Utility of Nanoparticles in Management of Plant Viruses. Nanotechnology-based Sustainable Alternatives for the Management of Plant Diseases. Elsevier (*2021)*
- **Carvalho, R**., Duman, K., Jones, J.B., Paret, M.L. Bactericidal Activity of Copper-Zinc Hybrid Nanoparticles on Copper-Tolerant *Xanthomonas perforans. Sci Rep* 9, 20124 (2019)
- **Carvalho, R**., Albu, S., Timilsina, S., Minsavage, G. V., Paret, M.L., Jones, J.B. Characterization of *Pseudomonas californiensis* sp. nov., *Pseudomonas magnoliae* sp. nov, and *Pseudomonas quasicaspiana* sp. nov., Three Novel Species Isolated from Ornamental Crops in California. IJSEM. *Submitted 2022*

- Liao, YY., Huang, Y., **Carvalho, R**., Choudhary, M., Da Silva, S., Colee, J., Huerta, A., Vallad, G.E., Freeman, J.H., Jones, J.B., Keller A.A., Paret, M.L. Magnesium Oxide Nanomaterial, an Alternative for Commercial Bactericides: Field Scale Tomato Bacterial Spot Disease Management and Total and Bioavailable Metal Accumulation in Soil. *Environ. Sci. Techonol*. (2021)
- Osdaghi, E., Jones, J.B., Sharma, A., Goss, E.M., Abrahamian, P., Newberry, E.A., Potnis, N., **Carvalho, R.**, Choudhary, M., Paret, M.L., Timilsina, S., Vallad, G.E. A Centenary for Bacterial Spot of Tomato and Pepper. *Molecular Plant Pathology* 00:1-20 (2021)
- Luckew, A., Meru, G., Wang. YY., Mwatuwa, R., Paret, M.L., **Carvalho, R**., Kalischuk, M., Silva, A.L.B.R., Candian, J., Dutta, B., Srinivasan, R., Kavalappara, S.R, Konakalla, RRD. N.C., Bag, S., McGregor C. Field Evaluation of *Cucurbita* Germplasm for Resistance to Whiteflies and Whitefly Transmitted Viruses. Hortscience 57(2):337–344 (2022)
- Herbert A., Hancock, N., Negrete, D., Cox, B., Schnabel G., **Carvalho, R**., Jones, J.B., Paret, M.L., Wang, H. First Report of Oxytetracycline and Streptomycin Resistance Genes in *Xanthomonas arboricola* pv. *pruni*, The Causal Agent of Bacterial Spot in Peach. *In press 2021*

LEADERSHIP AND ACADEMIC SERVICES (selected)

- **17th Biennial Florida Phytopathological Society**
  Graduate Student Liaison and Social Coordinator
- **Plant Pathology Graduate Students Organization – University of Florida**
  President 2020 – 2021
  Vice president 2019 – 2020
- **Conferences**
  APS - American Phytopathological Society
  Research on demand – August 2021
  Poster presentation – August 2020
  FPS – Florida Phytopathological Society
  Oral presentation – May 2021
  APS - American Phytopathological Society - Southern Division
  Oral presentation – February 2019
  NanoFlorida 2018 – Materials Innovation for a Sustainable Agriculture
  Oral presentation – October 2018

MENTORSHIP, WORKSHOPS AND TRAININGS

- Mentorship for 3 graduate students and 2 undergrads in plant bacteriology at the University of Florida including Teaching for Bacteriology in **Spring 2020** and **2021**
- SARE – Grant Writing Workshop. **November 2020**
- Private Applicator/Agricultural Row Crop Pesticide license – **November 2020**
- ABNT NBR ISO/IEC 17025:2005. Provided by Gestão Consultoria. 60 hours. **November 2016**
- LEAN projects for Sustainability. Provided by Global Plant Breeding Sustainability Lead, Michelle Glaspie. 32h. **October 2016.**