Gustavo A. Díaz Cruz
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Academic Information

2018-2023: **Ph.D. Biology**. *Memorial University of Newfoundland*.
2016-2018: **M.Sc. Life and Environmental Sciences**. *Brandon University*, Brandon, Manitoba.
2012-2014: **Licenciate degree Biotechnology Engineering**. *Instituto Tecnológico de Costa Rica*.
2007-2011**: Bachelor's degree Biotechnology Engineering.** *Instituto Tecnológico de Costa Rica*.

Work experience

January 2024 – To date
Universidad de Costa Rica – Crop Protection Research Center
Principal Investigator: Molecular identification of pathogens associated with cashew tree dieback in the Central Pacific region of Costa Rica.
Principal Investigator: Isolation and characterization of Streptomyces species associated with common scab disease in potato from Costa Rican fields.
Associate investigator: *In vitro* evaluation of fungicides to control the pathogens associated with the *Psidium guajava* scab in Costa Rica.

June 2011 - July 2016:
Senior Plant pathology lab supervisor. Biotech CR GRM S.A., Cartago, Costa Rica.

Duties

- Lab management: budgets, manual of procedures development and staff training.
- Phytopathological analysis of different crops.
- Microbiological analysis of soils, waters, and substrates.
- Design, execution, statistical analysis, and report elaboration of assays with phytosanitary products. Participation in more than 280 assays.
- Elaboration of reports in Spanish and English for domestic and international clients.
- Support to the R&D department in biofungicides projects.

Other research experience

August 2018 – December 2023
Doctoral research student.

- **Thesis project**: Investigating the specialized metabolism of the novel plant pathogen *Streptomyces* sp. 11-1-2.

August 2016 – July 2018
Master research student.

- **Thesis project**: Use of next generation sequencing to evaluate the presence of foliar pathogens on soybean.

January 2014 - August 2014:
Licenciate degree thesis project.

- **Thesis project**: Soil microorganisms associated to tomato (*Solanum lycopersicum*) isolated from commercial farms in Arancibia, Puntarenas, and in vitro sensitivity to agrochemicals.

January 2011 - June 2011:
Bachelor´s degree thesis project.

- **Thesis project**: Identification and molecular study of *Fusarium* sp., causal agent of Necrotic Wilt present in Agroforestry systems associated with vanilla crop (*Vanilla* sp.).

Peer-reviewed publications

- **Díaz-Cruz, G.A.**, Bignell, D.R.D. 2024. Exploring the specialized metabolome of the plant pathogen *Streptomyces* sp. 11-1-2. Scientific Reports 14, 10414.
- **Díaz-Cruz, G.A.**, Liu J., Tahlan, K., Bignell, D.R.D. 2022. Nigericin and Geldanamycin Are Phytotoxic Specialized Metabolites Produced by the Plant Pathogen *Streptomyces* sp. 11-1-2. Microbiology Spectrum. 10(2).
- **Díaz-Cruz, G.A.**, Cassone, B.J. 2022. Changes in the phyllosphere and rhizosphere microbial communities of soybean in the presence of pathogens. FEMS Microbiology Ecology. 98(3).
- **Díaz-Cruz, G.A.**, Cassone, B.J. 2021. Amplicon sequencing reveals extensive co-infections of foliar pathogens in soybean. *Plant Disease*. 105 (1), 127-133.
- Li, Y.*, Liu J.*, **Díaz-Cruz, G.A.*** Cheng, Z., Bignell, D.R.D. 2019. Virulence mechanisms of plant pathogenic *Streptomyces* species: an updated review. Microbiology. *Equally contributing authors.
- **Díaz-Cruz, G.A.**, Smith, C.M., Wiebe, K.F., Villanueva, S.M., Klonowski, A.R., Cassone, B.J. 2019. Applications of Next-Generation Sequencing for Large-Scale Pathogen Diagnoses in Soybean. *Plant Disease*. 103(6): 1075-1083.
- **Díaz-Cruz, G.A.**, Cassone, B.J. 2018. A Tale of Survival: Molecular Defense Mechanisms of Soybean to Overcome Soybean mosaic virus Infection. *Physiological and Molecular Plant Pathology*. 102(1).
- **Díaz-Cruz, G.A.**, Smith, C.M., Wiebe, K.F., Charette, J.M., Cassone, B.J. 2018. First Report of *Brome mosaic virus* Infecting Soybean, isolated in Manitoba, Canada. *Plant Disease*. 102(1).
- **Díaz-Cruz, G.A.**, Smith, C.M., Wiebe, K.F., Cassone, B.J. 2017. First complete genome sequence of Tobacco necrosis virus D isolated from soybean and from North America. *Genome Announc* 5:e00781-17.

Teaching experience

Universidad de Costa Rica

- August-December 2024: Plant pathology (AF-209): Lectures and laboratory
- March-July 2024: Fungicide mode of action and resistance management (AF-0219)

Teaching Skills Enhancing Program TSEP.
Memorial University of Newfoundland, 2020-2021:

- Under supevision of Dr. Dawn Bignell for Fundamentals of Plant pathology (BIOL 4052).

Lab Instructor:
Memorial University of Newfoundland, Winter 2023:

- Principles of biology (BIOL 1002).

Teaching assistant
Memorial University of Newfoundland:

- Fundamentals of Plant pathology (BIOL 4052), 2021
- Food Microbiology (BIOL 3052), 2020.
- Intro to Microbiology (BIOL 3050), 2019, 2020.
- Microbiology for nurses (BIOL 3053), 2019, 2021, 2023.
- Principles of biology (BIOL 1001), 2018, 2019, 2020, 2022.

Brandon University, 2016-2018:

- Diseases (15:366), 2018.
- Cells, genetics and evolution (15:162), 2017.

Awards

- 2022. Winner 3-Minute Thesis. Memorial University of Newfoundland.
- 2019. Governor General's Gold medal (Master's level).
- 2019. Brandon University Gold medal in the Master of Science (Environmental and Life Sciences). GPA: 4.30/4.30.
- 2018. Brandon University Alumni Association and Mrs. Kay Gardner Scholarship.
- 2014. Licenciatura degree graduation with academic distinction. GPA: 92/100.

Reviewer

- 2020 to date: Plant Disease (American Phytopathological Society), Plant Pathology (The British Society for Plant Pathology (BSPP)) and Canadian Journal of Microbiology (Canadian Society of Microbiologists).

Volunteering

- 2021 – 2022: BUG – Biology Undergraduate-Graduate Mentorship program.
- 2020 - 2022: Biology Graduate student association as faculty rep.

Conferences

- Poster: **Regulation of nigericin and geldanamycin biosynthesis in *Streptomyces* sp. 11-1-2 by *N*-acetylglucosamine.** 2022 International Symposium on the Biology of Actinomycetes (ISBA 2022). Toronto, Ontario.
- Oral Presentation: **Regulation of nigericin and geldanamycin biosynthesis in *Streptomyces* sp. 11-1-2 by *N*-acetylglucosamine.** 2022 Canadian Phytopathological Society Meeting. Virtual.
- Poster: **Two for the price of one: Insights into the role of nigericin and geldanamycin as potential virulence factors of the plant pathogen *Streptomyces* sp. 11-1-2.** 70th Annual Conference of the Canadian Society of Microbiologists (CSM 2021). Virtual. Finalist.
- Oral Presentation: **Putative phytotoxins produced by a novel plant-pathogenic *Streptomyces* strain from Newfoundland**. 2021 Biology Graduate Student Symposium. St. John's, Newfoundland and Labrador. Virtual.
- Oral Presentation: **Putative phytotoxins produced by a novel plant-pathogenic *Streptomyces* strain from Newfoundland**. 2020 Canadian Phytopathological Society – Atlantic Remote Meeting.
- Poster: **Characterization of novel virulence factors produced by a plant-pathogenic *Streptomyces* strain isolated in Newfoundland**. 2019 Biology Graduate Student Symposium. St. John's, Newfoundland and Labrador.
- Oral Presentation: **Application of Next Generation Sequencing on the study of plant pathogens of soybean**. 2018 Canadian Phytopathological Society – Atlantic Meeting. St. John's, Newfoundland and Labrador.
- Poster: **Comprehensive survey of foliar diseases in soybean using NGS**. 2017 Joint Conference of the Canadian Phytopathological Society and the Canadian Society of Agronomy. Winnipeg, Manitoba.

Languages

- English: Advanced English program (600 hours). 2015. UNED, Costa Rica.
- English: TOEFL 101/120. 2015.