IVAN MIJAIL DE LA CRUZ ARGUELLO

Mexico City, Mexico
03-August-1989 (33 years)
ivan.de.la.cruz.arguello@slu.se

RESEARCH INTERESTS

Evolutionary ecology, coevolution, plant genomics and local adaptation, quantitative genetics, evolution of plant defense to herbivory, chemical ecology, genome assembly and genome evolution, comparative genomics, bioinformatics, ecology

EDUCATION

June 2021 - present	**Postdoctoral researcher**, Department of Plant Protection Biology, Integrative Plant Protection Unit, Swedish University of Agricultural Sciences (SLU) Supervisor: Dr. Johan A. Stenberg
October 2020 – May 2021	**Postdoctoral Fellow,** Laboratory of Molecular Ecology, Institute for Research on Ecosystems and Sustainability, National Autonomous University of Mexico (UNAM) *Project: Ecology and Molecular evolution of Quercus in Mexico* Supervisor Dr. Ken Oyama Nakagawa
October 2020	**PhD in Philosophy (Honorific Mention),** Department of Evolutionary Ecology, Institute of Ecology, National Autonomous University of Mexico (UNAM) *Thesis: Adaptive evolution of resistance against herbivores in Datura stramonium* Supervisor Dr. Juan Núñez Fárfan
March 2015	**M.Sc. in Biology with Excellence Merits,** Department of Biology, Metropolitan Autonomous University (UAM), Mexico *Thesis: Microdistribution and microhabitat selection of small mammals in a forest of Central Mexico* Supervisor Dr. Alondra Castro Campillo
July 2011	**B.S. in Biology,** Department of Biology, Metropolitan Autonomous University (UAM), Mexico

APPOINMENTS/OVERSEA RESEARCH EXPERIENCE

07/06/2021 - present	**Postdoctoral Contract**, Department of Plant Protection Biology, Swedish University of Agricultural Sciences
October 2020 – May 2021	**Postdoctoral Contract**, Laboratory of Molecular Ecology, Institute for Research on Ecosystems and Sustainability, National Autonomous University of Mexico (UNAM)
01/09/2019 - 08/06/2020	**Visiting Scientist,** Ecological Genetics Research Unit, University of Helsinki, Finland Genomics of *Datura stramonium*, Supervisor Dr. Juha Merilä
26/03/2018 - 30/06/2018	**Visiting Graduate Student,** Department of Molecular Ecology, Max Planck Institute for Chemical Ecology, Germany Chemical ecology of plants, Supervisors Dr. Ian T. Baldwin, Dr. Meredith Schuman, Dr. Rayko Halitsche
3/03/2015 - 30/12/2015	**Research assistant**, Ecological Economy Group, Department of Economy Production, UAM, Mexico Ecology and sustainability, Supervisor Dr. David Barkin Rappaport

AWARDS/FELLOWSHIPS

2022	**New Phytologist Next Generation Scientists program**. Granted delegate and selected talk to attend the meeting in Tartu, Estonia.
2022	**American Society of Naturalist Graduate council virtual participation award for postdoc**s. Free attendance to Evolution meeting 2022 and free Membership for the Society 2022.
2021-present	**Employment**, Department of Plant Protection Biology, Swedish University of Agricultural Sciences
2021	**Free registration to the Society for Experimental Botany** annual Conference 2021. Attendee Category Low- and Middle-Income Countries
2021	**Global Participation Program**. Free registration for my participation in the annual meeting 2021 of the Society for Study of Evolution
2020	**Honorific Mention – PhD,** highest honors for my PhD studies at the Institute of Ecology, UNAM, Mexico
2020	**Genetics Society of America Presidential Membership award,** Genetics Society of America, USA
2015	**University Merit Medal - MSc,** highest honors for my MSc studies at UAM, Mexico
2020	**Encouragement of timely graduation award,** UNAM, Mexico
2016 - 2020	**Graduate Research Fellowship (PhD),** National Council of Science and Technology (CONACyT), Mexico
2012 - 2014	**Graduate Research Fellowship (MSc),** CONACyT, Mexico
2019 - 2020	**Finnish National Agency for Education Fellowship (nine months),** Visiting Scientist, University of Helsinki, Finland
2018	**Max Planck Society Fellowship (internship; three months),** Department of Molecular Ecology, Max Planck Institute for Chemical Ecology, Germany
2018	**Postgraduate Studies Support Program Fellowship (UNAM), internship at** Max Planck Institute for Chemical Ecology, Germany
2020	**Tree of Life Award - *Datura stramonium***. Dovetail Genomics. Improving the genome of *D. stramonium*.
2019	**Postgraduate Studies Support Program Fellowship (UNAM),** workshop, University of Copenhagen, Denmark
2017	**Postgraduate Studies Support Program Fellowship (UNAM)**, conference attendant at Mexican Scientific Society of Ecology, Mexico
2016	**Postgraduate Studies Support Program Fellowship (UNAM)**, field work, Teotihuacán, Mexico
2015	**PhD fellowships (declined),** University of Bristol, Universidad de Chile

PUBLICATIONS ***peer-reviewed***

Full text can be found in https://www.researchgate.net/profile/Ivan_De_La_Cruz_Arguello

De-la-Cruz, I. M., Kariñho-Betancourt, E., Núñez-Farfán, J., and Oyama, K. Gene family evolution and natural selection signature in *Datura* spp. (Solanaceae). ***Frontiers in Ecology and Evolution.***

De-la-Cruz, I. M., Osorio, S., Batsleer, F., Bonte, D., Diller, C., Hytönen, T. Muola, A. Posé, D., Vandegehuchte, M., and Stenberg, J. Evolutionary ecology of plant-arthropod interactions in light of the 'omics' sciences: A broad guide. ***Frontiers in Plant Science***. https://doi.org/10.3389/fpls.2022.808427

De-la-Cruz, I. M., Castro-Campillo, A., Salame-Méndez, A. 2021. Habitat heterogeneity facilitates coexistence of two syntopic species of Peromyscus in a temperate forest of Central Mexico. ***Therya***. https://doi.org/10.12933/therya-21-1113

Velazquéz-Márquez, S., De-la-Cruz, I. M., Tapia-López, R., Núñez-Farfán, J. Tropane alkaloids and terpene synthase genes of *Datura stramonium* (Solanaceae). ***PeerJ***. https://doi.org/10.7717/peerj.11466

De-la-Cruz, I. M., Hallab, A., Olivares, U., Tapia-López, R., Velázquez-Márquez, S., Piñero, D., Oyama, K., Usadel, B., and Núñez-Farfán, J. (2020). Genomic signatures of the evolution of defence against its natural enemies in the poisonous and medicinal plant *Datura stramonium* (Solanaceae). ***Scientific Reports.*** https://doi.org/10.1038/s41598-020-79194-1

De-la-Cruz, I. M., Merilä, J., Valverde, P. L., Flores-Ortiz C. M., and Núñez-Farfán, J. (2020). Genomic and chemical evidence for local adaptation in resistance to different herbivores in *Datura stramonium*. ***Evolution; International Journal of Organic Evolution***. https://doi.org/10.1111/evo.14097

De-la-Cruz, I. M., Cruz, L. L., Martínez-García, L., Valverde, P. L., Flores-Ortiz, C. M., Hernández-Portilla, L. B., and Núñez-Farfán, J. (2020). Evolutionary response to herbivory: Population differentiation in microsatellite loci, tropane alkaloids and leaf trichome density in *Datura stramonium*. ***Arthropod-Plant Interactions.*** https://doi.org/10.1007/s11829-019-09735-7

De-la-Cruz, I. M., Velázquez-Marquez, S., and Núñez-Farfán J. (2020). What do we know about the genetic basis of plant defensive responses to herbivores? a minireview. In: ***Evolutionary Ecology of Plant-Herbivore Interaction*** (Eds. Juan Núñez-Farfán and Pedro Valverde). pp 295-314. Springer Nature. https://doi.org/10.1007/978-3-030-46012-9_16

De-la-Cruz, I. M., Núñez-Farfán, J. (2020). The complete chloroplast genomes of two Mexican plants of the annual herb *Datura stramonium* (Solanaceae). ***Mitochondrial DNA Part B***. https://doi.org/10.1080/23802359.2020.1789516

De-la-Cruz, I. M., Castro-Campillo, A., Zavala-Hurtado, A., Salame-Méndez, A., and Ramírez-Pulido, J. (2019). Differentiation pattern in the use of space by males and females of two species of small mammals (*Peromyscus difficilis* and *P. melanotis*) in a temperate forest. ***Therya***. DOI: 10.12933/therya-19-668

COURSES, WORKSHOPS AND DIPLOMAS (last five years)

Diploma: Multivariate statistical analysis, UAM
Diploma: Conservation and ecology of species in risk of extinction, UAM
Diploma: Introduction to GIS theory and remote Perception with emphasis on open source software, UAM
Diploma: Desertification and sustainable agriculture in fragile or degraded agroecosystems
Course: Statistical analysis applied to the distribution patterns of species, UAM
Course: Use of space and habitat selection models UAM
Course: Ecological and evolutionary theory (modules I, II, III), UAM
Course: Mathematical models in biology, UAM
Course: Biostatistical analyses, UAM
Course: Regression and multivariate analyses, UAM
Course: Quantitative and ecological genetics, UNAM
Course: Genomic studies and its general applications, UNAM
Course: Adaptive molecular evolution, UNAM
Course: Selected topics of plant physiology: Anatomy, Nutrition, Photosynthesis and Transport, UNAM
Course: Introduction to bioinformatics using bacterial genomics, UNAM
Course: Population genetics, UNAM
Course: Ecological genomics, UNAM
Workshop: Bioinformatic and analysis of genomic data, UNAM
Workshop: Introduction to the management and data analysis of massive DNA sequencing, UNAM
Workshop: Introduction to Liquid Chromatography/Time-of-Flight/Mass Spectra (HPLC-TOF-MS). UNAM
Workshop: Assembling and annotation of genomes, UNAM
Workshop: Analysis of next generation sequencing data with Galaxy (RNA-seq and ChIP-seq), UNAM
Workshop: JMP Applied to Multivariate statistical analysis, UAM
Workshop: Practical workshop on large-scale genomic data analyses: GWAS in structured populations, The National Laboratory of Genomics for Biodiversity (LANGEBIO), Mexico
Workshop: Next generation sequencing and population genomics, University of Copenhagen. Denmark
Workshop: Unix and R applied to bioinformatics, UNAM
Workshop: RepeatExplorer; discovering repeats in NGS data. Virtual.
Workshop: Entomovectoring, Swedish University of Agricultural Sciences, Alnarp
Course: NOVA Course – Integrated Pest – Pollinator Management, Swedish University of Agricultural Sciences, Alnarp

RESEARCH GRANTS

Genomics of plant defence. CONACyT, Mexico (#1527). Co-author and project leader. Director: Dr. Juan Núñez Farfán (185,020.72 usd)
Genomic analysis of the adaptation of resistance against herbivores in *Datura stramonium* (#IG200717). Support Program for Research Projects and Technological Innovation (PAPIIT), UNAM, Mexico. Co-author and project leader. Director: Dr. Juan Núñez Farfán (138,765.54 usd)

CONFERENCES/PRESENTATIONS

2022 — Mexican Scientific Society for Ecology. Regular talks for high school students. **Speaker**
Cómo defenderse de tus enemigos cuándo eres una planta?

2022 — New Phytologist Next Generation Scientists meeting, Tartu, Estonia. **Speaker**
Genomic basis of the evolution of resistance against its natural enemies in the poisonous and medicinal plant *Datura stramonium* (Solanaceae)

2021 — International Workshop on Entomovectoring, organized by Paul Egan and Heikki Hokkanen, SLU. **Speaker**

2021 — Ecological genomics of *Datura stramonium*

	Seminar Biodiversity Unit, University of Turku, Finland, **Speaker**.
2021	Chemical ecology of *Datura stramonium* Seminar Department of Plant Protection Biology, Swedish University of Agricultural Sciences, Sweden. **Speaker**
2021	Genomic and chemical evidence for local adaptation in resistance to different herbivores in *Datura stramonium* Virtual Evolution 2021. Society for the study of Evolution **Speaker**
2019	Adaptive evolution of resistance against herbivores in *Datura stramonium* VII Mexican National Conference of Ecology, Mexico. **Speaker**
2019	Natural history and infestation dynamic of three herbivores specialist of *Datura stramonium* VII Mexican National Conference of Ecology, Mexico. **Speaker**
2018	Genome assembly and annotation of *Datura stramonium* (Solanaceae) Student Seminar, Institute of Ecology, UNAM, México. **Speaker**
2017	Differentiation in chemical and physical defense in two native populations of *Datura stramonium* VI Mexican National Conference of Ecology. Mexico. **Speaker**
2017	Habitat heterogeneity promotes coexistence in the use of space of two *Peromyscus* (Cricetidae) in a template forest VI Mexican National Conference of Ecology. **Poster**
2016	Selection and use of the microhabitat by two *Peromyscus* in a conifer forest XIII Mexican National Conference of Mastozoology. **Poster**
2016	Ecological microdistribution in two *Peromyscus* of a temperate forest in central Mexico XIII Mexican National Conference of Mastozoology. **Speaker**
2014	Differential seasonal use of individual reproductive space of *Peromyscus difficilis felipensis* and *P. melanotis* (Rodentia: Cricetidae) 63rd Annual Meeting of Southwestern Association of Naturalist. **Poster**
2013	Microhabitat quality classification for small mammals in a temperate forest of conifers XII Mexican National Conference of Mastozoology. **Poster**

TEACHING EXPERIENCE

01/02/2015 – 31/07/2015	Biology, Chemistry, Instituto Especializado en Estudios Intensivos S.C. (I.D.E.A.), Mexico City (high school)
01/08/2015 – 17/12/2015	Biology and Sustainability, UAM (undergrad students)
15/01/2017 – 31/07/2017 15/01/2019 – 31/07/2019	Quantitative and Ecological genetics, UNAM (bachelor and graduate students)

MEMBERSHIPS/AFFILIATIONS

Society for the Study of Evolution (SSE)
Society for Molecular Biology and Evolution (SMBE)
Genetics Society of America (GSA
Iberoamerican Society of Bioinformatics (SolBio)
Sociedad Científica Mexicana de Ecología (SCME)

REVIEWER

Mitochondrial DNA Part B: Resources (3)
Journal of Plant Research (2)
Ecology and Evolution (2)
Plant Ecology (1)
PCI Ecology (1)
Evolutionary Bioinformatics (1)
The Crop Journal (1)
Acta Oecologica (1)

WEBPAGES

	Twitter https://twitter.com/muerteorcos GitHub https://github.com/icruz1989 (Here are deposited all workflows, scripts and bioinformatic pipelines that were used during my doctorate studies) ResearchGate https://www.researchgate.net/profile/Ivan_De_La_Cruz_Arguello My blog for science communication www.plantiverso.com
SKILLS	Unix, Stats, HPLC, Insect/Plant care, R, JMP, Bioinformatics, Field work, Lab work

ACADEMIC CONTACTS

Professor Juan Núñez Farfán,
Department of evolutionary ecology
Laboratory of quantitative genetics and evolutionary ecology
Institute of Ecology, UNAM
farfan@unam.mx

Professor Johan A. Stenberg
Department of plant protection biology
Integrated plant protection group
Swedish University of Agricultural Sciences
Johan.Stenberg@slu.se

Professor Ken Oyama Nakawaga
Institute for Research on Ecosystems and Sustainability
Escuela Nacional de Estudios Superiores Campus Morelia
kenoyama@enesmorelia.unam.mx

Professor Daniel Piñero Dalmau
Department of ecological biodiversity
Laboratory of plant genetics and evolution
Institute of Ecology, UNAM
pinero@ecologia.unam.mx