

IVAN MIJAIL DE LA CRUZ ARGUELLO

Ciudad de México, México

03-Agosto-1989 (31 años)

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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 (Honorable 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

APPOINTMENTS/OVERSEA RESEARCH EXPERIENCE

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. 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

2021-present

Postdoctoral fellowship, Department of Plant Protection Biology, Swedish University of Agricultural Sciences (SLU)

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 - <i>Datura stramonium</i> . Dovetail Genomics. Improving the genome of <i>D. stramonium</i> .
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., 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*. <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.

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* (#1G200717). 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

PhD studies

2021	Genomic and chemical evidence for local adaptation in resistance to different herbivores in <i>Datura stramonium</i> Virtual Evolution 2021. Society for the study of Evolution Speaker
2019	Adaptive evolution of resistance against herbivores in <i>Datura stramonium</i> VII Mexican National Conference of Ecology, Mexico. Speaker
2019	Natural history and infestation dynamic of three herbivores specialist of <i>Datura stramonium</i> VII Mexican National Conference of Ecology, Mexico. Speaker
2018	Genome assembly and annotation of <i>Datura stramonium</i> (Solanaceae) Student Seminar, Institute of Ecology, UNAM, México. Speaker
2017	Differentiation in chemical and physical defense in two native populations of <i>Datura stramonium</i> VI Mexican National Conference of Ecology. Mexico. Speaker

MSc studies

2017	Habitat heterogeneity promotes coexistence in the use of space of two <i>Peromyscus</i> (Cricetidae) in a template forest VI Mexican National Conference of Ecology. Poster
2016	Selection and use of the microhabitat by two <i>Peromyscus</i> in a conifer forest XIII Mexican National Conference of Mastozoology. Poster
2016	Ecological microdistribution in two <i>Peromyscus</i> of a temperate forest in central Mexico XIII Mexican National Conference of Mastozoology. Speaker
2014	Differential seasonal use of individual reproductive space of <i>Peromyscus difficilis felipensis</i> and <i>P. melanotis</i> (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	Quantitative and Ecological genetics, UNAM (bachelor and graduate students)
15/01/2019 – 31/07/2019	

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 (1)
Ecology and Evolution (2)

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

SKILLS

Unix, Stats, HPLC, Insect/Plant care, R, JMP, Bioinformatics, Field work, Lab work

ACADEMIC CONTACTS

Professor Juan Núñez Farfán,

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Laboratory of quantitative genetics and evolutionary ecology
Institute of Ecology, UNAM
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Professor Johan A. Stenberg

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Integrated plant protection group
Swedish University of Agricultural Sciences
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Professor Ken Oyama Nakawaga

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Escuela Nacional de Estudios Superiores Campus Morelia
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Professor Daniel Piñero Dalmau

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