Carlos Alonso Maya Lastra

Curriculum Vitae

website: http://camayal.info/
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PROFESSIONAL EDUCATION

Institute of Ecology A.C. (Mexico)
Ph.D. in Science (August 2018)
Dissertation title: Untouchables: taxonomy and evolutionary history of *Cnidoscolus* (Euphorbiaceae).
Advisor: Ph.D. Victor W. Steinmann

Institute of Ecology A.C. (Mexico)
Master in Science (August 2014)
Thesis title: Evolutionary history and taxonomy of the *Euphorbia polycarpa* complex (Euphorbiaceae).
Advisor: Ph.D. Victor W. Steinmann

University of Quindío (Colombia)
Bachelor in Biology and Environmental Education (September 2007)
Thesis title: Taxonomic inventory of the family Euphorbiaceae in the Quindío department (Colombia). **Laureate thesis.**
Advisor: Ph. D. Carlos Alberto Agudelo Henao

PROFESSIONAL APPOINTMENTS

Columbia University, Department of Ecology, Evolution and Environmental Biology (USA)
February 2019 – present — Postdoctoral Scientific Researcher. Conducting research in evolution of reproductive isolation using computational genomics approaches and their application to empirical data for a different group of plants.

Administrative Department of Science, Technology and Innovation (Colombia) and *Universtity of Quindío (Colombia)*
March 2010 – March 2011 — Young researcher. Main researcher of the project titled "Evaluación Palinológica de tres especies Forestales Amenazadas de la Flora Andina Colombiana".

The United Nations Development Programme (UNDP) and *National Federation of Coffee Growers of Colombia*

November – December 2009 Contract. In charge of fast characterization of vegetation in the Quindío coffee, included in the project "Incorporación de biodiversidad en las zonas cafeteras de Colombia"

University of Quindío (Colombia)

August – December 2006 Herbarium assistant in HUQ, involved as student.

January 2005 – July 2006 Student researcher in the project "Creation of a seed bank of native species from Quindío department".

PUBLICATIONS

Maya-Lastra, C. A. & Steinmann, V. W. 2019. Evolution of the untouchables: phylogenetics and classification of *Cnidoscolus* (Euphorbiaceae). *Taxon* 68(4): 692-713. JIF (2018): 3.823

Ruiz-Sanchez, E., **Maya-Lastra, C. A.**, Steinmann, V. W., Zamudio, S., Carranza, E., Murillo, R. M., & Rzedowski, J. 2019. Datataxa: a new script to extract metadata sequence information from GenBank, the Flora of Bajío as a case study. *Botanical Sciences* 97(4):754-760. JIF (2018): 0.936

Maya-Lastra, C. A. & Steinmann, V. W. 2019. Novelties in Mexican *Cnidoscolus* sect. *Calyptrosolen* (Euphorbiaceae). *Systematic Botany*, 44(2):339-345. doi: 10.1600/036364419X15562052252081. JIF (2018): 1.259

Maya-Lastra, C. A. & Steinmann, V. W. 2018. A Nomenclator of *Cnidoscolus* (Euphorbiaceae). *Phytotaxa* 346 (1): 1–30. doi:10.11646/phytotaxa.346.1.1. JIF (2018): 1.168

Maya-Lastra, C. A. Porter, J. Mark & Steinmann, V. W., 2017. Evolutionary History and Taxonomy of the *Euphorbia polycarpa* Complex (*Euphorbia* subg. *Chamaesyce* sect. *Anisophyllum*, Euphorbiaceae). *Systematic Botany*, 42 (2): 257–270. doi:10.1600/036364417X695565. JIF (2017): 1.515

Maya-Lastra, C. A. 2016. ColectoR, a Digital Field Notebook for Voucher Specimen Collection for Smartphones. *Applications in Plant Sciences*, 4(7):1600035. doi:10.3732/apps.1600035. JIF (2016): 1.492

The Brazil Flora Group (BFG).file 2015. Growing Knowledge: An Overview Of Seed Plant Diversity In Brazil. *Rodriguésia* 66(4): 1085–1113. doi: 10.1590/2175-7860201566411.

Maya-Lastra, C. A. & Steinmann, V. W. 2015. Two new species of *Euphorbia* subg. *Chamaesyce* (Euphorbiaceae) from Baja California Sur, Mexico and their phylogenetic relationships. *Phytotaxa*, 221 (3): 265–278. doi:10.11646/phytotaxa.221.3.4. JIF (2015): 1.087

Cordeiro, I., Caruzo, M. B. R., Pscheidt, A. C. & **Maya-Lastra, C. A.** 2011. Euphorbiaceae. In: Wanderley, M. G. L. et al. (eds.) Checklist of spermatophyta of the São Paulo state, Brazil. *Biota neotrop.* 11(1a): 259-263.

Maya-Lastra, C. A. & Agudelo H., C. A. 2011. Euphorbiaceae del Quindío. Ed. Universidad del Quindío. ISBN 978-958-8593-17-3. 80 pp.

Maya-Lastra, C. A. & Agudelo H., C. A. 2010. Lista anotada de las especies de Euphorbiaceae para el Quindío. *Rev. Invest. Univ. Quindío* (20): 126-136.

Maya-Lastra, C. A. & Secco, R. 2010. *Dalechampia* (Euphorbiaceae). In: Campostrini, R. et al. (eds.) 2010. *Catálogo de Plantas e Fungos do Brasil*. Instituto de Pesquisas Jardim Botânico do Rio de Janeiro. 2: 976-978. ISBN 978-85-88742-43-7.

Cordeiro, I., Secco, R. & **Maya-Lastra, C. A.** 2010. *Tragia* (Euphorbiaceae). In: Campostrini, R. et al. (eds.) 2010. *Catálogo de Plantas e Fungos do Brasil*. Instituto de Pesquisas Jardim Botânico do Rio de Janeiro. 2: 989. ISBN 978-85-88742-43-7.

Maya-Lastra, C. A. & Agudelo H., C. A. 2009. Estudio taxonómico de la familia Euphorbiaceae en el Quindío (Extenso). Revista De La Asociación Colombiana De Ciencias Biológicas 21: 156 - 173. ISSN 0120-4173

SOFTWARE AND SCRIPTS FOR BIOLOGICAL USES

Maya-Lastra, C. A. 2020. TreeToM. Simple tool for visualizing phylogenetic trees onto a map. Coded in Javascript. https://camayal.info/wa/treetom/

Maya-Lastra, C. A. & Eaton, D. 2019 – 2020. dmiSim. Set of scripts for simulating realistic populations to study how demographic parameters influence Dobzhansky and Muller incompatibilities evolution in SLiM framework and result visualization. Coded in Eidos, Python, and R. In development.

Maya-Lastra, C. A. & Eaton, D. 2019 – 2020. dmiGenerator. Program that allows generate theoretical Dobzhansky and Muller incompatibilities among a given number of genes. Coded in Python. In development.

Maya-Lastra, C. A. 2016 **–** 2019. Datataxa. Script for automatic metadata extraction from GenBank sequences using Entrez database API and classification based on the kind of study where the sequences were used. Coded in *Autoit*. http://camayal.info/scripts.htm

Maya-Lastra, C. A. 2014 – 2019. ColectoR. Digital Field Notebook for Voucher Specimen Collection for Smartphones. Coded in *Javascript*. http://camayal.info/colector.htm

Maya-Lastra, C. A. 2017. ConvertFileUsingAlterAPI. Script to convert easily sequences files using ALTER API. Coded in *Python*. http://camayal.info/scripts.htm

Maya-Lastra, C. A. 2017. FastChangeNames. Provides an alternative for non-familiar users of terminal or console to change names in files like phylogenetic trees, matrixes and others. Coded in *AutoIt*. http://camayal.info/scripts.htm

Maya-Lastra, C. A. 2016. MIC (Manual Image Classify). Small application to facilitate the classification or taking data (notes) from images. Coded in *AutoIt*. http://camayal.info/scripts.htm

Maya-Lastra, C. A. 2016. HerbivoryScript for ImageJ. Macro to conduct an assisted herbivory area analysis in leaves using images and color threshold functions on ImageJ. Coded in*: ImageJ Macro Language*. http://camayal.info/scripts.htm

Maya-Lastra, C. A. 2014. ChecklistBuilder. Software for Windows that assists to the botanist in the checklist creation, permitting integrate information from a raw database into a printable report with a customizable format and layout. Coded in: *Neobook Script*. http://camayal.info/checklistbuilder.htm

Maya-Lastra, C. A. 2007. SinóptiK. Key for identification of Euphorbiaceae species found in Department of Quindío (Colombia). Coded in: *Neobook script*. http://camayal.info/sinoptik.htm

ONGOING PROJECTS

Maya-Lastra, C. A. Eaton, D., *et al*. Replicated evolution of leaf form in a neo-tropical radiation of *Viburnum* (Adoxaceae)

Maya-Lastra, C. A. Eaton, D., *et al*. Functional annotation of *Viburnum lautum* genome (Adoxaceae)

Maya-Lastra, C. A., Ruiz-Sanchez, E., Duputié, A. & Steinmann, V. W. Parallel diversification and biogeography of *Cnidosculus* (Euphorbiaceae).

Maya Lastra, C. A. & Steinmann, V. W. Behind complex evolutionary history *Cnidoscolus angustidens-maculatus*.

Maya-Lastra, C. A., Carneiro-Torres, D., Marques, O. & Cordeiro, I. *Cnidoscolus* in Flora de Brazil 2020.

Perez-Garcia, L., **Maya-Lastra C. A.**, Porter, J. M., Montero, J. C. & Lara-Cabrera, S. Phylogenomics of *Salvia* L. subgenus *Calosphace* (Lamiaceae)

AWARDS

December 2014	*Premio a la Excelencia Creativa y Espiritu Innovador 2014*, with the software: **ColectoR: field notebook for easy collection of plant specimen data using smartphones**. By Institute of Ecology A.C., Mexico.
June 2010	***Cuatrecasas Fellowship Award** 2010*, awarding a trip to US herbarium to study Euphorbiaceae collection. By Smithsonian Institution.

October 2009	*Premio Nacional Hernando Patiño* as **best undergraduate work presented** in XLIV Congreso Nacional de la Asociación Colombiana de Ciencias Biológicas.

TEACHING EXPERIENCE

January – May 2018	Visiting professor of **Bioinformatics**. ENES (Morelia), National Autonomous University of Mexico.
April 2015	Teaching assistant of **Techniques of phylogenetic reconstructions**. Institute of Ecology A.C., Mexico.
January – December 2004	Teaching assistant of **Plant morphology**. University of Quindío, Colombia.
August – December 2003	Teaching assistant of **Biology**. University of Quindío, Colombia.

MENTORING EXPERIENCE

June 2019 – present	Co-advisor of Undergraduate student Daniel Simbron Romero in the thesis "Diferencias genéticas de tres complejos de especies en *Salvia* (Lamiaceae)." Michoacan University of Saint Nicholas of Hidalgo (UMSNH).
Sept.2018 – March 2019	Methodology advisor of Master student Luz Perez-Garcia in the thesis "Filogenómica de *Salvia* subgénero *Calosphace* (Lamiaceae)." Michoacan University of Saint Nicholas of Hidalgo (UMSNH)

SCHOLARSHIPS AND FELLOWSHIPS FOR PROFESSIONAL FORMATION

September 2014. **National scholarship for postgraduate studies CONACYT** (N° 391982, registry 280328) for a period of 48 months, given by The National Council on Science and Technology, Mexico, to course the Doctorate. (~ $ 47.000 USD)

September 2012. **National scholarship for postgraduate studies CONACYT** (N° 345304, registry 280328) for a period of 23 months, given by The National Council on Science and Technology, Mexico, to course the Master degree. (~ $ 15.600 USD)

December 2009. **Fellowship Virginia Gutierrez de Pineda**, as Young researcher and innovator, given by Administrative Department of Science, Technology and Innovation, founding 12 months for research work to study the pollen of three species of Quindío (Colombia). (~ $ 8.400 USD)

January 2007. **Academic Excellence Scholarship** of the Program of Bachelor in Biology and Environmental Education, due to the best academic score of the program, given by the University of Quindío (Colombia).

August 2006. **Academic Excellence Scholarship** of the Program of Bachelor in Biology and Environmental Education, due to the best academic score of the program, given by the University of Quindío (Colombia).

January 2006. **Academic Excellence Scholarship** of the Program of Bachelor in Biology and Environmental Education, due to the best academic score of the program, given by the University of Quindío (Colombia).

August 2005. **Academic Excellence Scholarship** of the Program of Bachelor in Biology and Environmental Education, due to the best academic score of the program, given by the University of Quindío (Colombia).

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January 2003. **Academic Excellence Scholarship** of the Program of Bachelor in Biology and Environmental Education, due to the best academic score of the program, given by the University of Quindío (Colombia).

ADDITIONAL COURSES AND FORMATION

October 2017 *High-Throughput sequencing, assembly and analysis for phylogenetic and evolutionary studies*. Offered by Universidad Michoacana de San Nicolás Hidalgo. Professor Ph.D. J. Mark Porter from Rancho Santa Ana Botanic Garden. (120 hours)

April 2013 *Temperate ecology for tropical students: Ecology of North Temperate Forests, Habitat Assessment and Sustainability*. Offered by Powdermill Nature Reserve and Institute of Ecology A.C. Main professor Ph.D. John W. Wenzel. (120 hours)

February 2010 *Electronic microscopy course 2010*. Offered by Centro de Excelencia en Nuevos Materiales - University of Valle. (16 hours)

August 2007 *Application of software BRAHMS 6.0 to manage herbaria.* Offered by Post-graduate office of Science-Biology and Biology department of University of Valle. Professor Ph.D. Michael Hopkins from INPA (Instituto Nacional de Pesquisas da Amazônia). (35 hours)

July 2005 *Bromeliaceae and Heliconiaceae workshop*. Offered by ACH (Asociación Colombiana de Herbarios). Professor Ph.D. Julio Betancourt from Instituto de Ciencias Naturales of National University of Colombia. (10 hours)

SHORT RESEARCH STANCES AND VISITS

Rancho Santa Ana Botanic Garden – RSA-POM herbarium (Claremont, California, U. S. A.)
September 2017, May 2016, September, March, and January 2013. Learning of molecular techniques for extraction, amplification and preparation of DNA for Sanger and High-throughput sequencing for phylogenetic studies. Under supervision of Ph.D. Victor W. Steinmann and Ph.D. J. Mark Porter.

Institute of Botany of São Paulo – SP herbarium (São Paulo, SP – Brazil)
March 2008 – July 2008. Scientific early career improvement. Thanks to the Scholarship RLB08-P04, given by The Latin American Plant Sciences Network to conduct the research "Revisão dos gêneros *Bia*, *Dalechampia*, *Plukenetia*, *Romanoa* e *Tragia* (Euphorbiaceae s.s.) para o Estado de São Paulo (SP-Brasil)". Under supervision of Ph.D. Inês Cordeiro.

Smithsonian Institution – US herbarium (Washington D.C., U. S. A.)
November 2010 – December 2010. Short visit to study botanical collection of Euphorbiaceae, especially Plukenetieae tribu. Under supervision of Ph.D. Kenneth Wurdack.

MEETING PRESENTATIONS

July 2019 Poster and Oral presentation in Botany. Tucson (U.S.A.)
ColectoR, a digital field notebook for voucher specimens collection for Android.
The untouchables: taxonomy and phylogenetics of Cnidoscolus (Euphorbiaceae)

October 2013 Poster in XIX Congreso Mexicano de Botánica. Tuxtla Gutiérrez (Mexico).
Estudio filogenético del complejo Euphorbia polycarpa (Euphorbiaceae) basado en marcadores de núcleo y cloroplasto.

October 2010 Poster of two works in X Latin American Botanical Congress. La Serena (Chile).
Revisão dos gêneros de lianas da família Euphorbiaceae s.s. para o Estado de São Paulo – Brasil.
Estado preliminar de Dalechampia Plum. ex L. (Euphorbiaceae) para Colombia.

October 2009 Oral presentation in XLIV Congreso Nacional de la Asociación Colombiana de Ciencias Biológicas. Popayán (Colombia). ***Awarded*** with the National award Hernando Patiño.

Revisión taxonómica de la familia Euphorbiaceae Juss. para el departamento del Quindío - Colombia.

Abril 2007 Poster in IV Congreso Colombiano de Botánica. Medellín (Colombia). *Inventario de la familia Euphorbiaceae Juss. para el departamento del Quindío – Colombia.*

FUNDING FOR SHORT STANCES

February 2017. Student mobility fund of postgraduate office of Institute of Ecology A. C. to prepare libraries for RADSeq in the molecular laboratory of Rancho Santa Ana Botanic Garden. (~ $ 630 USD)

January 2016. Student mobility fund of postgraduate office of Institute of Ecology A. C. to spend one semester in Rancho Santa Ana Botanic Garden. (~ $ 1650 USD)

February 2014. Student mobility fund of postgraduate office of Institute of Ecology A. C. to visit Rancho Santa Ana Botanic Garden. (~ $ 673 USD)

August 2013. Student mobility fund of postgraduate office of Institute of Ecology A. C. to CAS, UC and RSA herbaria. (~ $ 747 USD)

December 2012. Extra support (Beca Mixta) given by CONACYT (Mexico), to learn DNA sequencing techniques in Rancho Santa Ana Botanic Garden. (~ $ 1.275 USD)

June 2010. Cuatrecasas Fellowship Award to visit US herbarium: ($ 2.200 USD)

July 2010. Funding for assistance X Latin American Botanical Congress given by The Latin American Plant Sciences Network. (~ $ 1.000 USD)

February 2008. Scientific early career improvement (RLB08-P04) given by The Latin American Plant Sciences Network to visit the Institute of Botany of São Paulo for four months, Brazil. ($ 2.571 USD)

SKILLS

Languages: Spanish (native), Portuguese, and English.

Programming languages: *Python, Bash, Eidos, Autoit, C#, HTML* and *CSS, PHP, Javascript, Neobook script,* other minor languages or macro scripting.

Software: ***Operative systems*** (Windows, multiple distributions of Linux (e.g. Ubuntu, Mint), Android). ***Databases*****:** (BRAHMS; Access, Excel (professional level and scripting)). ***Phylogenetic analysis*****: (**WinClada, PAUP, MrBayes, JModelTest, MEGA, PhyML, ASTRAL). ***Sequence analysis:*** (ipyrad, MarkerMiner, HybPhyloMaker, Codon Code Aligner, Sequencher).

Molecular biology: DNA extraction, PCR amplification, Sanger sequencing, High-throughput sequencing samples and library preparations.

RESEARCH INTERESTS

- Evolutionary aspects in plants with emphasis in Euphorbiaceae genera like *Dalechampia*, *Euphorbia,* and *Cnidoscolus*.
- Taxonomy and morphology of Euphorbiaceae family.
- Evolution and hybridization in species-complex and domesticated plants (i.e. *Euphorbia polycarpa* complex, *Cnidoscolus angustidens* complex, *Cnidoscolus aconitifolius*).
- Development of software for biological uses focused on intuitive interface and operation.
- Bioinformatics applications to resolve evolutionary problems.
- Machine learning application in non-visual plant identification.