

# CECILIA ZUMAJO-CARDONA

cezumajo.github.io

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## EDUCATION

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**The New York Botanical Garden & The Graduate Center- CUNY - 2021**

Ph.D. in Biology, Plant Science subprogram

**The New York Botanical Garden & The Graduate Center- CUNY - 2019**

Master of Philosophy Biology

**B.Sc. in Biology, Universidad de Antioquia, Medellín, Colombia - 2015**

## PROFESSIONAL POSITIONS

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**Assistant Curator - New York Botanical Garden 2025 - Currently**

## LANGUAGES

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Spanish (Mother tongue), English, Italian, French.

## ACADEMIC EXPERIENCE

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**STARS@UNIPD Postdoctoral researcher - May 2024 to January 2025**

Universita degli Studi di Padova. Project title: "Deciphering the molecular mechanisms behind seed diversity in non-model species: case of study in *Cycas* and *Wollemia*."

**EMBO Postdoctoral researcher - October 2021 to April 2024**

Universita degli Studi di Milano. Project title: "Deciphering the maternal role in seed formation using transcriptome and genetic variation analyses."

**Lab. assistant, Evo-Devo in Plants. November 2015 to August 2016**

Universidad de Antioquia. P.I. Natalia Pabón - Mora. Project title: "Functional Evolution of the *FRUITFULL* gene lineage in the tomato family (Solanaceae)"

**EDEN, Evo-Devo-Eco Network Undergraduate Fellowship. June to August, 2015**

New York Botanical Garden, Genomics program, PI: Barbara Ambrose "*Can the fruit developmental network of Arabidopsis thaliana be extrapolated to early diverging eudicots?*".

**Cathedra teacher assistant. January- June 2015**

Maths for High school, Medellín, Colombia

**Young researcher. 2013 - 2014**

Project '*Duplicacion de genes FUL-like en Ranunculales y su impacto en la diversificación morfológica de amapolas*'. PI: Natalia Pabón - Mora, CODI, Universidad de Antioquia, Medellín, Colombia

**Herbarium assistant - 2013**

Universidad de Antioquia, Medellín, Colombia

Assistant herbarium workshop: 'Herbario Universidad de Antioquia' (HUA)

## PUBLICATIONS [ORCID: 0000-0002-9516-6112]

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*Preprints & in preparation:*

Stevenson et al., **The genome of the Wollemi pine, a critically endangered “living fossil” unchanged since the Cretaceous, reveals extensive ancient transposon activity** *BioRxiv*. doi: <https://doi.org/10.1101/2023.08.24.554647>

*Published:*

**Zumajo-Cardona, C., Gabrieli, F., Anire, J., Albertini, E., Ezquer, I., Colombo, L. Evolutionary studies of the bHLH transcription factors belonging to MBW complex: revisiting their role in seed development** *Annals of Botany*. <https://doi.org/10.1093/aob/mcad097>

**Zumajo-Cardona, C., Aguirre, M., Castillo, R., Mizzotti, C., Di Marzo, M., Banfi, C., Mendes, M. A., Spillane, C., Colombo, L., Ezquer, I. Maternal control of triploid seed development by the *TRANSPARENT TESTA 8* transcription factor in *Arabidopsis thaliana*** *Scientific reports* 13, 1316 (2023). <https://doi.org/10.1038>

Marchant, D.B., Chen, G., Cai, S. ... **Zumajo-Cardona, C. ... et al. 2022. Dynamic genome evolution in a model fern.** *Nature Plants* <https://doi.org/10.1038/s41477-022-01226-7>

Rothwell, G. W., Stockey, R. A., Stevenson, D. W., and **Zumajo-Cardona, C.** 2022. **Large Permineralized Seeds in the Jurassic of Haida Gwaii, Western Canada: Exploring the Mode and Tempo of Cycad Evolution** *International Journal of Plant Sciences*, 183(8), 000-000.

**Zumajo-Cardona, C., and Ambrose, B.** 2022. **Fleshy or dry: Transcriptome analyses reveal the genetic mechanisms underlying bract development in *Ephedra*** *BMC EvoDevo* 13, 10 <https://doi.org/10.1186/s13227-022-00195-4>

**Zumajo-Cardona, C., Stevenson, D., Little D., and Ambrose, B.** 2021. **Expression analyses in *Ginkgo biloba* provide new insights into the evolution and development of the seed.** *Scientific reports*. <https://doi.org/10.1038/s41598-021-01483-0>

**Zumajo-Cardona, C., Frangos, S. and Stevenson, D.** 2021. **Seed anatomy and development in Cycads and Ginkgo, keys for understanding the evolution of seeds.** *Flora* doi:10.1016/j.flora.2021.151951

Zhu, K., Zheng, X., Ye, J., Huang, Y., Chen, H., Mei, X., Xie, Z., Cao, L., Zeng, L., Larkin, R.M., Xu, Q., Perez-Roman, E., Talón, M., **Zumajo-Cardona, C.,** Wurtzel, E., Deng, X. 2021 **Regulation of carotenoid and chlorophyll pools in hesperidia, anatomically unique fruits found only in Citrus** *Plant Physiology*, 187: 829–845, <https://doi.org/10.1093/plphys/kiab291>

**Zumajo-Cardona, C., and Ambrose, B.** 2021 **Deciphering the evolution of the ovule genetic network through expression analyses in *Gnetum gnemon*.** *Annals of Botany*; 128: 217–230.

**Zumajo-Cardona, C., Pabon-Mora, N., and Ambrose, B.** 2021. **The evolution of *euAPETALA2* genes in vascular plants: from plesiomorphic roles in sporangia to acquired functions in ovules and fruits.** *Molecular Biology and Evolution*; <https://doi.org/10.1093/molbev/msab027>

Ambrose, B., Smalls, T., and **Zumajo-Cardona, C.,** 2021. **All Type II Classic MADS-genes in the Lycophyte *Selaginella moellendorffii* are broadly yet discretely expressed in vegetative and reproductive tissues.** *Evolution and Development*; <https://doi.org/10.1111/ede.12375>

**Zumajo-Cardona, C., and Ambrose, B.** 2020. **Phylogenetic analyses of key developmental genes provide insight into the complex evolution of seeds** *Molecular Phylogenetics and Evolution* Vol 147; doi: 10.1016/j.ympev.2020.106778

**Zumajo-Cardona, C., Vasco, A., and Ambrose, B.** 2019. **The Evolution of the *KANADI* Gene Family and Leaf Development in Lycophytes and Ferns.** *Plants*. 8:313.

**Zumajo-Cardona, C., Pabon-Mora, N., and Ambrose, B.** 2018. **Duplication and**

diversification of *REPLUMLESS* – a case study in the Papaveraceae. *Frontiers in Plant Science*. doi: 10.3389/fpls.2018.01833.

Stevenson, D., and Zumajo-Cardona, C. 2018. From Plant Ontology to Gene Ontology and back. *Current Plant Biology*. doi: 10.1016/j.cpb.2018.09.009.

Zumajo-Cardona, C., Ambrose, B., and Pabon-Mora, N. 2017. Evolution of the *SPATULA/ALCATRAZ* Gene Lineage and expression analyses in the Basal Eudicot, *Bocconia frutecens* L. (Papaveraceae). *EvoDevo* doi: 10.1186/s13227-017-0068-8.

Zumajo-Cardona, C., and Pabon-Mora, N. 2016. Evolution of the *APETALA2* Gene Lineage in Seed Plants. *Molecular Biology and Evolution*. doi:10.1093/molbev/msw059.

S. Marcellini, F. González, A. F. Sarrazin, N. Pabón-Mora, M. Benítez, A. Piñeyro-Nelson, G. L. Rezende, E. Maldonado, P. Neiva Schneider, M. B. Grizante, R. Nunes DA Fonseca, F. Vergara-Silva, V. Suaza-Gaviria, C. Zumajo-Cardona, E. E. Zattara, S. Casasa, H. Suárez-Baron, and F. D. Brown. 2016. Evolutionary Developmental Biology (Evo-Devo) Research in Latin America. *J. Exp. Zool. B Mol. Dev. Evol.* doi: 10.1002/jez.b.22687

## PROGRAMMING LANGUAGES

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Bash - AWK - Python (+ RNA-Seq analyses)- <https://github.com/cezumajo>

## CONGRESSES, SEMINARS AND COURSES

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- International Botanical Congress (IBC), Madrid, Spain** July, 2024  
*Talk: "Untangling the developmental genomics of the unique reproductive structures in Gnetales"*
- **Flowering mechanisms workshop Palermo, Italy** June, 2024  
*Poster and Flash talk: "Untangling the developmental genomics of the unique reproductive structures in Gnetales"*
- **EMBO course: Leadership for Postdocs, Heidelberg, Germany** April, 2023
- **26th International Conference on Sexual Plant Reproduction, Prague** June 20 to 24, 2022  
*Poster: "bHLH genes in the MBW complex, more than flavonoid biosynthesis genes"*
- **Botany - Virtual** July 18 to 23, 2021  
*"Deciphering development of the seed coat in morphologically diverse seeds in members of Gnetales: Gnetum gnemon, Ephedra californica and Ephedra antisiphilitica"*
- **Botany - Virtual** July 27 to 31, 2020  
*"Evolution of the seed coat."*
- **The society for Integrative and Comparative Biology, SICB. Austin, TX** January 3 to 8, 2020  
*Short talk: The evolution of the integument and its implication in seed plant evolution.*
- **Venice summer school 2019: Mechanism in development and evolution** August 26 to 30, 2019  
*EMBO. Venice, Italy. Short course.*
- **Botany, Tucson, Arizona.** July 27 to 31, 2019  
*Two short talks: "Evolution of the integument developmental genes in seed plants" and "Anatomical development of the ovules in Cycadales."*
- **The Genome access course TGAC.** November 11 to 13, 2018  
*Cold Spring Harbor and CUNY. New York, U.S.A. Short course.*
- **II Joint Congress on Evolutionary Biology** August 19 to 22, 2018  
*Poster. "Fleshy fruits and Fleshy seeds in gymnosperms, a case of convergent evolution?"*

- **Botany, Rochester, Minnesota.** July 21 to 25, 2018  
*Short talk: "Evolution of the RPL gene lineage in Papaveraceae"*
- **IX Latin American Society of Developmental Biology Meeting** October 9 to 13, 2017  
*Short talk: "Expression analyses of fruit developmental genes in selected non-core eudicots"*
- **Course: Comparative Genomics and transcriptomics in non-model species - Medellín, Colombia.** October 2 to 6, 2017  
*By Jeramiah Smith, University of Kentucky and Yvan Wenger, Université de Genève.*
- **XIX International Botanical Congress, Shezhen, China.** July 23 to 29, 2017  
*Short talk: "Lycophyte evolution and development: a transcriptomic and genetic approach" Outstanding Student Award.*
- **Primer Encuentro Nacional de Biología del Desarrollo, Bogotá, Colombia** September 24 to 26, 2015  
*Short talk: "Evolution of the APETALA 2 gene lineage in seed plants"*
- **First Panamerican Evo-Devo meeting, Clark Kerr Campus, University of California Berkeley** August 5 to 9, 2015  
*Short talk: "Evolution of the APETALA 2 gene lineage in seed plants"*
- **VII Colombian congress of botany: VII Congreso Colombiano de Botánica, Ibagué-Tolima, Universidad del Tolima** August 7 to 10, 2013  
*Poster exhibitor, first prize undergraduate Poster*
- **Course: 'Curso de Ómicas, Actualización en genómica, transcriptómica y proteómica'** 2013  
*Universidad de Antioquia, Medellín, Colombia*
- **Course: 'Estrategias para la conservación ex situ de recursos fitogenéticos'** 2013  
*Organized by the Instituto Nacional de Ciencias Agrícolas (INCA) Cuba, dictated by: Maria Esther Gonzalez Vega.*
- **VI Colombian congress of botany: 'VI Congreso Nacional de Botánica'** August 11 to 15, 2011  
*Universidad Javeriana, Cali, Colombia*

## AWARDS AND GRANTS

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**STAR@UNIPD - STARs starting grant by Università degli studi di Padova**

Postdoctoral Fellowship 170.000Euros

**EMBO - European Molecular Biology Organization** Postdoctoral Fellowship 132.000Euros

**Seal of Excellence** by the European Commission, MSCA Postdoctoral Fellowships In 2022.

**Katherine Esau Award** by the Botanical Society of America In 2020.

**Bill Dahl Graduate Student Research Award** by the Botanical Society of America \$1500 in July 2019.

**Doctoral Student Research Grant -** The Graduate Center, CUNY. \$1500. In 2019.

**BSA Development and Structural Section with the publication** *Expression and functional studies of basal eudicot REPLUMLESS homologs during flower and fruit development.* In 2018.

**First Prize, Student Research Award,** with the publication *Evolution of the APETALA2 Gene Lineage in Seed Plants.* Universidad de Antioquia, Medellín, Colombia. In 2016.

**EDEN, Evo-Devo-Eco Network** Undergraduate Fellowship in 2015 \$3000

**Best undergraduate Poster** VII Colombian congress of botany: VII Congreso Colombiano de Botánica, Ibagué, Tolima. In 2013.

## FIELD EXPERIENCE

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Boyaca, Colombia- With Dr. Favio Gonzalez and Dr. Natalia Pabon-Mora November 2022  
Parasitic species collections

Whitewater preserve, California, February 2019 *Ephedra californica* collections

Palo Pinto Co., Texas, February 2019 *Ephedra antisyphilitica* collections

## TEACHING EXPERIENCE

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**Invited lecturer, Plant Evolution and Development class at SUNY courtland, NY, USA.**

**Topic: Seed development and evolution**

*April 5 - 2023*

· **Invited lecturer, Molecular Genetics class at Otterbein University, Ohio, USA.**

**Topic: expression analyses: in situ hybridization and RNA sequencing**

*August 29 - 2022*

· **Plant Structure, NYBG - Adult Education program**

*February 2021 - April 2021*

· **Plant Diversity, NYBG - Adult Education program**

*October 2020 - November 2020*

· **Principles of Biology Lab 167: Organisms. Lehman College, CUNY**

*February 2020 - June 2020*

· February 2019 - June 2019 *Three sections, 7.5 hours weekly*

· February 2019 - June 2019 *Three sections, 7.5 hours weekly*

· February 2018 - June 2018 *Two sections, 5 hours weekly*

**Principles of Biology Lab 166: Cell and Genes. Lehman College, CUNY**

*August 2019 - December 2019*

August 2018 - December 2019 *Three sections, 7.5 hours weekly*

· February 2018 - June 2018 *Two sections, 5 hours weekly*

## STUDENT MENTORING EXPERIENCE

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**Master dissertation co-tutoring**, to Eleonora Cavalera, University of Milano, Italy

*"Deciphering the role of cytokinins in seed development and triploid block"*

October 2021 - June 2022

**Undergraduate dissertation co-tutoring**, to Eliana Mendelson, Brandeis University

*"Expression analyses of fruit genes in selected basal angiosperms"* Excellence in Research

Award, August 2019 - May 2020

**Undergraduate dissertation co-tutoring**, to Dominique Jeton Groffman, Columbia

University Student *"Evolution of the SPOROCTELESS/SPEAR gene family across land plants"* February 2018 - August 2019

**Mentor**, PLANTS Program (Preparing Leaders and Nurturing Tomorrow's Scientists: Increasing diversity of plant scientists) Botanical Society of America, *"Botany 2020 Virtual & Botany 2021 Virtual"* 2020 -2021

## OUTREACH

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Mendelson, E., **Zumajo-Cardona, C.**, and Ambrose, B. **What is a leaf?** *Front. Young Minds*.10:659623. doi: 10.3389/frym.2022.659623 (Science communication paper).

Mendelson, E., **Zumajo-Cardona, C.**, and Ambrose, B. 2020. **What is a fruit?** *Frontiers for Young Minds* 8:27. doi: 10.3389/frym.2020.00027 (Science communication paper).

**Zumajo-Cardona, C.**, and Pabón-Mora, N., 2017 **APETALA2 un gen que forma flores y frutos.** *Experimenta - Universidad de Antioquia* (Science communication article in spanish)

*Podcast episode In Defense of plants*, Episode 319. *Evolution of the seed*  
<https://www.indefenseofplants.com/podcast/2021/5/30/4fvzoezmxzbz791g2hh3cb7lige7oy9>

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## SERVICES

BSA International affairs committee - Student representative 2019 – 2021

Plant Science advisory committee meeting, Lehman College CUNY 2019 – 2020

Plant Science Executive committee Student Representative, CUNY 2018 – 2019

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## EDITORIAL ROLES

*Subject Editor* Flora, Elsevier

*Reviewer Editor* Evolutionary Developmental Biology- Frontiers

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## PROFESSIONAL REFERENCES

Dr. Dennis W. Stevenson  
Emeritus Curator NYBG and Editor, Botanical Review  
email: dws@nybg.org

Dr. Natalia Pabón - Mora  
Associate Professor, Universidad de Antioquia  
email: lucia.pabon@udea.edu.co

Dr. Lucia Colombo  
Professor, Università degli Studi di Milano  
email: lucia.colombo@unimi.it