

# Maria Fernanda Torres, PhD

<https://orcid.org/0000-0002-7177-4164> | [mftorres27@gmail.com](mailto:mftorres27@gmail.com)

## EMPLOYMENT

### SENIOR RESEARCHER VILNIUS UNIVERSITY

LIFE SCIENCES CENTRE  
Feb 2022- | Vilnius, Lithuania

### POSTDOCTORAL RESEARCHER UNIVERSITY OF GOTHENBURG

DEPARTMENT OF BIOLOGICAL &  
ENVIRONMENTAL SCIENCES  
Oct 2018-2021 | Gothenburg, Sweden

### RESEARCHER AND CURATOR DNA AND TISSUE COLLECTION

INSTITUTO DE INVESTIGACIONES  
ALEXANDER VON HUMBOLDT  
Jan 2013-Jan 2014 | Cali, Colombia

## EDUCATION

### UNIVERSITY OF EDINBURGH

PHD IN EVOLUTIONARY BIOLOGY  
Jan 2014-Nov 2018 | Edinburgh, UK

### UNIVERSIDAD DE LOS ANDES

MASTER IN EVOLUTIONARY BIOLOGY  
Jun 2010-Jun 2012 | Bogotá, Colombia

### UNIVERSIDAD DE LOS ANDES

BACHELOR IN EVOLUTIONARY BIOLOGY  
Jun 2006-Jun 2010 | Bogotá, Colombia

## SKILLS

Spanish (fluently written and spoken)  
English (fluently written and spoken)  
Lithuanian (basic level)

Bioinformatics and programming  
Whole genome and target sequence data  
quality check and assembly, from Illumina and  
Nanopore data.

Variant calling and file manipulation with GATK,  
picard, samtools, VCFtools, angsd, and similar  
toolkits.

High Performance Computing systems.

Phylogenomics and phylogenetics using  
Maximum Likelihood and Bayesian approaches

Programming in Python (particularly proficient  
in pandas and matplotlib), Bash, R, HTML.

## PROFILE

I am a biologist with a research focus on biodiversity and evolution. My work centers around using phylogenetics, phylogenomics, and bioinformatics methods to gain insights into the underlying mechanisms governing speciation, adaptation, and changes in biodiversity. While my expertise spans across various organisms, I predominantly work with plants and insects as model systems. As an independent researcher, I am responsible for overseeing all aspects of the scientific process, including experiment design, fieldwork, data acquisition, analysis, and visualization, as well as communicating and disseminating my findings. Beyond my research pursuits, I also engage in science communication and community outreach activities, striving to increase public awareness and understanding of environmental and social issues that impact our world.

## PUBLICATIONS

- 2022** Antonelli A, Smith RJ, Perrigo AL, Crottini A, Hackel J, Testo W, Farooq H, **Torres Jimenez, MF**, [76 authors]. Madagascar's extraordinary biodiversity: Evolution, distribution, and use. *Science*, 378(6623), p.eabf0869.
- 2022** Ralimanana H, Perrigo AL, Smith RJ, [68 authors]; **Torres Jimenez, MF**, [7 authors]. Madagascar's extraordinary biodiversity: Threats and opportunities. *Science*, 378(6623), p.eadf1466.
- 2022** Treiber EL, Zalamea PC, **Torres MF**, Madriñán, Weiblen, GD. Molecular Systematics, Species Concepts, and Myrmecophytism in *Cecropia* (Cecropiaceae: Urticaceae): Insights from Restriction-Site Associated DNA. *Systematic Botany*, 47(2), 457-466.
- 2022** Prata EMB\*, **Torres Jimenez MF\***, Bacon CD, de Oliveira AVG, Emilio T. The Description of a Charismatic New Palm Species in the Amazon. *PALMS*, 66(2), 57-65. \*shared first authorship.
- 2022** Sanín MJ, Cardona A, Valencia-Montoya WA, **Torres Jimenez MF**, Carvalho-Madrigal S, Gómez C, Bacon CD, Roqueme Tangarife T, Jaramillo JS, Zapata A, Valencia V, Arboleda Valencia JW, Vargas V, Paris M. Volcanic events coincide with plant dispersal across the Northern Andes. *Global and Planetary Change*, 210, 103757
- 2021** **Torres Jimenez MF**, Stone G, Sanchez A, Richardson JE. Comparative phylogeography of an ant-plant mutualism: An encounter in the Andes. *Global and Planetary Change*, 103598.
- 2021** Pérez-Escobar OA, Dodsworth S, Bogarin D, Bellot S, Balbuena JA, Schley R, Kikuchi Izai, Morris SK, Epitawalage N, Cowan R, Maurin O, Zuntini A, Arias T, Serna A, Gravendeel B, **Torres Jimenez MF**, Nargar K, Chomicki G, Chase MW, Leitch IJ, Forest F, Baker WJ. Hundreds of nuclear and plastid loci yield insights into orchid relationships. *American Journal of Botany*, 108(7), 1166-1180.

## GRANTS

2023-2025 • Horizon MSCA Postdoctoral Fellowship ENTWINE.

2020-2021 • INTERACT-TA grant for an expedition in Utqiagvik - Alaska, US (used by Adrian Hill due to Covid).

2019-2020 • The Royal Society of Arts and Sciences in Gothenburg

2019-2020 • Gustaf Adolfs Bratts forelasningsfond for science outreach and communication

2019-2020 • International Palm Society endowment for research

2015-2016 • Davis Expedition Fund for fieldwork expeditions

2014-2015 • Davis Expedition Fund for fieldwork expeditions

2014-2017 • The Darwin Trust of Edinburgh. Postgraduate research scholarship

2011-2013 • Catalyzing New International Collaborations Program, NSF Grant No. 1132916

2011-2012 • Fondo de Investigaciones de la Facultad de Ciencias, Universidad de los Andes

2006-2010 • Quiero estudiar fellowship, Universidad de los Andes

## REFERENCES

• Dr. James Richardson – University College Cork. Ireland. UK.  
[jrichardson@ucc.ie](mailto:jrichardson@ucc.ie)

• Dr. Adriana Sánchez – Universidad del Rosario, Departamento de Biología. Bogotá, Colombia.  
[adriana.sanchez@urosario.edu.co](mailto:adriana.sanchez@urosario.edu.co)

• Dr. Allison Perrigo – University of Gothenburg, Gothenburg, Sweden.  
[allison.perrigo@bioenv.gu.se](mailto:allison.perrigo@bioenv.gu.se)

• Dr. Alexandre Antonelli – Royal Botanic Garden Kew, Richmond, Surrey, U.K. [a.antonelli@kew.org](mailto:a.antonelli@kew.org)

## PUBLICATIONS (CONTINUATION)

- 2021** Pérez-Escobar OA, Bellott S, Przelomska NAS, Flowers JM, Nesbitt M, Ryan P, Gutaker RM, Gros-Balthazard M, Wells T, Kuhnhauser BG, Schley R, Bogarín D, Dodsworth S, Diaz R, Lehmann M, Petoe P, Eiserhardt WL, Preick M, Hofreiter M, Hajdas I, Purugganan M, Antonelli A, Gravendeel B, Leitch IJ, **Torres Jimenez MF**, Papadopoulos AST, Chomicki G, Renner SS, Baker WJ. Molecular clocks and archaeogenomics of a Late Period Egyptian date palm leaf reveal introgression from wild relatives and add timestamps on the domestication. *Molecular Biology and Evolution*, msab188.
- 2021** Serna-Sanchez MA, Perez-Escobar OA, Bogarin D, **Torres Jimenez MF**, Alvarez-Yela AC, Arcila JE, Hall CF, de Barros F, Pinheiro F, Dodsworth S, Chase MW, Antonelli A, Arias T. Plastid phylogenomics resolves ambiguous relationships within the orchid family and provides a solid timeframe for biogeography and macroevolution. *Scientific Reports*, 11(1)1-11.
- 2021** **Torres Jimenez MF\***, Prata EMB\*, Zizka A, Cohn-Haft M, de Oliveira AVG, Emilio T, Chazot N, Couvreur TLP, Mogue Kamga S, Sonke B, Cano A, Collevatti RG, Kuhnhauser BG, Baker WJ, Antonelli A, Bacon CD. Molecular phylogenomics of the palm tribe Lepidocarpaceae (Calamoideae: Arecaceae) and description of a new species of *Mauritiella*. *Systematic botany*, 46(3) 863-874  
**\*shared first authorship**.
- 2021** Ribeiro PG, **Torres Jimenez MF**, Andermann T, Antonelli A, Bacon CD, Matos-Maraví P. An improved bioinformatic platform to integrate short-read, target sequence capture and whole genome sequences of various read depths. *Molecular Ecology*, 30 6021–6035.
- 2021** Hill A, **Torres Jimenez MF**, Chazot N, de Cassia CS, Faurby S, Bacon CD. Fruit colour and range size interact to influence diversification. *bioRxiv*, 2021.10.26.465838. We show how fruit color interacts with dispersal and results in high diversification in medium-range species
- 2021** **Torres Jimenez MF**, Chazot N, Emilio T, Uddling JF, Antonelli A, Faurby S\*, Bacon CD\*. Plant height predicts leaf shape in palms (Arecaceae). *bioRxiv* 2021.10.26.465896  
Shared last co-authorship.
- 2019** Andermann T\*, **Torres MF\***, Matos-Maraví P, Liberal IM, Batista R, de Sousa F, Blanco-Pastor J, Gustafsson ALS, Bacon CD, Antonelli A. A technical guide for target sequence capture in ecology and evolution. *Frontiers in Genetics*, 10:1407.  
**\*shared first authorship**.
- 2017** **Torres MF** and Sanchez A. Neotropical ant-plant *Triplaris americana* attracts *Pseudomyrmex mordax* ant queens during seedling stages. *Insect Social*. 64(2):255-261.

- 2016** Mendoza ÁM, **Torres MF** , Paz A, Trujillo-Arias N, López-Alvarez D, Sierra S, Forero F. and Gonzalez MA. Cryptic diversity revealed by DNA barcoding in Colombian illegally traded bird species. *Molecular Ecology Resources*, 16:862-873.
- 2015** Stevenson PR, Link A, González-Caro S, and **Torres MF**. Frugivory in Canopy Plants in a Western Amazonian Forest: Dispersal Systems, Phylogenetic Ensembles and Keystone Plants. *PloS one*, 10(10) 0140751.
- 2015** Arbeláez-Cortés E, **Torres MF** , López-Álvarez D, Palacio-Mejía JD, Mendoza ÁM and Medina CA. Colombian frozen biodiversity: 16 years of the tissue collection of the Humboldt Institute. *Acta Biológica Colombiana*, 20(2):163-173.
- 2012** **Torres MF** , Madriñán S, Weiblen GD. *Cecropia*- Ant interactions in Colombia: Identification and specialization network analysis. Master's thesis. Department of Biological Sciences, Universidad de los Andes. Bogotá, Colombia.
- 2010** **Torres MF** , Sánchez A, Quijano C, Madriñán S. Neotropical ant-plant *Triplaris americana* leaf volatiles as attractants of *Pseudomyrmex mordax* ant queens. Undergraduate thesis. Department of Biological Sciences, Universidad de los Andes. Bogotá, Colombia.

## OUTREACH PUBLICATIONS

- 2021** Duncan G, Lefort MC, Mehrian-Shai R, Chakrabarty P, **Torres MF** . Beyond DNA: The rest of the story. *Science*, 371(6529):560-563
- 2019** Wasalathanthri ND, Zaidi SS, Mahrt E, Srivastava S, Yu K, Johansson KSL, Li F, **Torres Jimenez MF** , Lo C, Allareddy V, Romero-Molina C, Mosegaard S, Heaton SM, Park JJ, Bacon CD, Yu S, Polat EO, Wasalathanthri D, Wang W, Agarwal D. Challenging transitions. *Science*, 363(6422):24-26.

## ONGOING RESEARCH (SELECTED)

• Genomic basis of leaf shape variation in the Amazonian palm *Geonoma macrostachys*. **Torres Jimenez MF** , Sanín MJ, Carvalho S, Ospina A, Antonelli A, Bacon CD. My involvement includes study design, sample collection, DNA extractions, quality check and *de novo* assembly of *G. macrostachys* Illumina and Nanopore reads, population genetics using pool-seq data, and manuscript production.

## PRESENTATIONS (SELECTED)

- 2022** Deadwood-associated fungi and insect communities under plant invasions. Kew research Seminar, Royal Botanic Garden Kew, UK.
- 2022** Mutualismos entre plantas y hormigas, evolución entre montañas. Research Seminar, Universidad del Rosario, Colombia.
- 2021** Temperature as important driver of leaf dissection in palms (Arecaceae). Palms 2021.
- 2020** Phylogenomics and phylogeography to understand ant mutualisms. Invited speaker for the Genome Sciences seminar, University of Washington, USA
- 2019** Introduction to Bash and how to manage large amounts of data. Presentations at the Antonelli Lab Software Club, University of Gothenburg. Gothenburg, Sweden
- 2017** Effects of Andean geographic history on the population history of the plant-ant *Azteca*. Naomi Pierce lab seminar. Harvard University. Cambridge MA, USA
- 2013** Interacciones *Cecropia*- hormiga en Colombia: Identificación y análisis de la red de asociaciones. **Torres MF** , Weiblen GD, Madriñán S. VII Congreso Colombiano de Botánica, Ibagué, Colombia.

- 2011** Interacción planta-hormiga: Atracción química de *Triplaris americana* a reinas de *Pseudomyrmex mordax*. **Torres MF**, Sánchez A, Quijano C, Madriñán S. VI Congreso Colombiano de Botánica, Cali-Colombia.
- 2010** Interacción planta-hormiga: Atracción química de *Triplaris americana* a reinas de *Pseudomyrmex mordax*. **Torres MF**, Sánchez A, Quijano C, Madriñán S. Seminar at Universidad Nacional de Colombia. Bogotá, Colombia.

## POSTERS

- 2017** **Torres MF**. Effects of Andean geographic history on the population history of the plant-ant *Azteca*. Evolution 2017, Portland OR, USA.
- 2017** **Torres MF**. Effects of Andean geographic history on the population history of the plant-ant *Azteca*. "Ecological genomics of coevolutionary interactions" workshop at ETHzurich, 2017, Weggis, Switzerland.
- 2016** **Torres MF**. Effects of Andean geographic history on the population history of the plant-ant *Azteca*. Poster presentation for third year students, School of Biological Sciences, University of Edinburgh. Edinburgh, UK.
- 2013** Torres MF, Weiblen GD, **Madriñán S**. "*Cecropia*- ant interactions in Colombia: Identification and network analysis" Poster presentation, Botany, New Orleans, USA.
- 2013** **Torres MF**, Weiblen GD, Madriñán S. "*Cecropia*- ant interactions in Colombia: Identification and network analysis" Poster for the Sciences Faculty research forum at Universidad de los Andes, Bogotá, Colombia.

## TRAINING

- 2021** "Oh-Know" k-mer-based approaches for non-model organisms. ForBio. virtual.
- 2019** Workshop on Model-based inference in Phylogeography - from single species to communities. ForBio. Drøbak, Norway.
- 2019** Workshop on Genomics. evomics.org. Český Krumlov, Czechia.
- 2017** Ecological genomics of coevolutionary interactions. ETHzurich. Weggis, Switzerland.
- 2017** Population genomics workshop. University of Sheffield. Sheffield, UK.
- 2015** Computational Molecular Evolution. Wellcome Trust Advanced Courses. Cambridge, UK.
- 2014** One week course: Introduction to Python, University of Edinburgh. Edinburgh, UK.
- 2012** Workshop in Evolutionary approaches to biodiversity science. ATBC 2012, Bonito-MS, Brazil.

## OUTREACH (SELECTED)

- |                  |                     |   |
|------------------|---------------------|---|
| <b>2021</b>      | Blog video          | Mutualismo y co-evolución plantas-hormiga. Research interview for Colombia's science communication channel "Ciencia café pa' sumercé". Shared via Facebook (21k views) and Twitter.   |
| <b>2021</b>      | Conversatory        | Building sciences for peace in Latin America: Interdisciplinary experiences from Colombia. Organised and hosted an event to discuss the historical effect of the conflict and reflect on solutions and experiences that help building peace.                              |
| <b>2019-2020</b> | Documentary         | Zafire: lessons from the Amazon documentary at the International Science Festival in Gothenburg. The documentary follows my expedition to collect palms in the Amazon. I coordinated the expedition, the filming and helped during the pre-production. Gothenburg, Sweden |
| <b>2019</b>      | Blog post           | Looking for palms in the Amazon forest, Antonelli-lab website.<br><a href="http://antonelli-lab.net/wp-admin/post.php?post=802&amp;action=edit">http://antonelli-lab.net/wp-admin/post.php?post=802&amp;action=edit</a>   |
| <b>2019</b>      | Public presentation | International Biodiversity Day: Tales from the field<br>Goteborgs Naturhistoriska Museum  |
| <b>2019</b>      | Mentorship          | 1000 girls 1000 futures mentorship program program<br>The New York Academy of Sciences  |
| <b>2017</b>      | Blog post           | The smell of a brand new house, Insectes Sociaux<br><a href="https://insectessociaux.com/2017/06/09/the-smell-of-a-brand-new-house/">https://insectessociaux.com/2017/06/09/the-smell-of-a-brand-new-house/</a>   |
| <b>2017</b>      | Organizer           | March for Science. Me and other three collaborators lead, organized and coordinated the march. From permits to stewarding. Edinburgh, UK  |
| <b>2016</b>      | Presenter, editor   | "rbgeColombia, eight years of ongoing collaborative research". Stand for the state visit of the President of Colombia's. Natural History Museum. London, UK   |

<b>2015</b>	Presenter	Cabaret of Dangerous Ideas -The Cocaine Conspiracy. Public outreach and education event about positive and negative impacts of drug legalization. Fringe Festival, Edinburgh, UK
<b>2015</b>	Presenter	Seminar: the environmental impact of the illegal production, trade and consumption of cocaine. Uppsala University, Sweden
<b>2014 - 2015</b>	Guide and presenter	Expedition Botanics at the Edinburgh International Science Festival. Edinburgh, UK
<b>2014</b>	Presenter	Cabaret of Dangerous Ideas -Between white lines. Public outreach and education event about social and environmental impacts of cocaine production. Fringe Festival, Edinburgh, UK

## TEACHING

**2022** Workshop in Target Sequence data for 25 students, University of Gothenburg, Sweden (at Tjärnö).  
**2020** Workshop in Target Sequence data for 25 students, University of Gothenburg, Sweden (online).  
**2019** Workshop in Bioinformatics for beginners (4 students), teaching basic Unix commands, how to process and analyse genomic data, from sequences to a species tree. Universidad CES, Colombia.  
**2015-2016** Demonstrating for the "Population and Community Ecology" course. University of Edinburgh, UK  
**2015-2016** Demonstrating for the "Ecological and Environmental Analyses" course. University of Edinburgh, UK  
**2015** Demonstrating for the "Origin and Diversity of Life" course. Royal Botanic Garden Edinburgh, UK  
**2010-2012** Laboratory practicals and lectures for the "Plants and Humans" course at the Bachelor's degree level, targeted to students outside the biology curriculum.

## SUPERVISION

**2022-2026** Supervision of Milda Riepšaitė (Ph.D. student) at Vilnius University.  
**2021-2025** Co-supervision of Gabriel Damasco (Post-Doc) and Adrian Hill (Ph.D. student) at the University of Gothenburg regarding bioinformatic methods, phylogenomics, and population genomics.

## MOLECULAR BIOLOGY

**2019-2021** High weight DNA extraction for Illumina and Nanopore sequencing.  
**2013-2017** DNA extraction for Sanger and Illumina sequencing, barcoding and PCR amplification, library preparation for Illumina sequencing. DNA purification methods.  
**2012-2013** Barcoding of samples in the DNA and tissue collection at the Instituto de investigaciones Alexander von Humboldt, Colombia.  
**2010-2012** DNA extractions and barcoding of ant and plant material for the Weiblen Lab (Minnesota, USA) and the Madriñán Lab (Bogotá, Colombia).

## FIELDWORK EXPEDITIONS (ORGANISED AND RAN)

**2019** Conservation and diversity in the Amazonian forest: Palms of the Amazon. Two weeks of sampling material and documentary recording.  
**2013-2016** Exploring the roles of geographic barriers in determining ant-plant mutualistic associations. Twelve one-week expeditions throughout Colombia's rain forest.  
**2012** Plantas acuáticas de la Orinoquia Colombiana. Two one-week long expeditions to survey and collect aquatic plants in the Colombian savannas.  
**2010-2012** *Cecropia* -Ant interactions in Colombia: Identification and specialization network analysis. Around six expeditions following Colombia's roads to collect *Cecropia* plants and their inhabiting ants.  
**2011** Restauración ecológica en bosques de sabana en la reserva Tomo Grande, Vichada. Month-long expedition to the Colombian savannas to collect seedlings and set up experiments of reforestation.  
**2010** Neotropical ant-plant "varasanta" leaf volatiles as attractants of associated ant queens. Monthly expeditions throughout one year, performing *in situ* experiments with ants and collecting plant material for chemical analyses.

## PEER-REVIEW

- Invited editor for the special issue "Bioinformatics for plant biology" for the Application in Plant Sciences Journal.
- Peer-review for Methods in Ecology and Evolution, Frontiers in Plant Sciences, and Molecular Ecology Resources.